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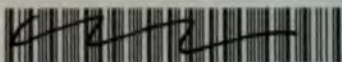
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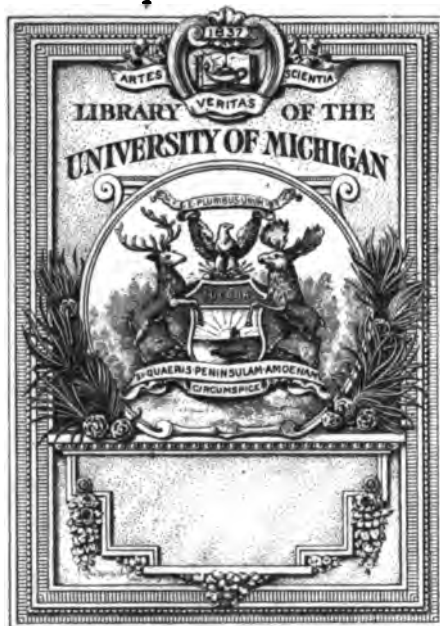
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A QUARTERLY OF CLINICAL LECTURES

ON

MEDICINE, SURGERY, GYNÆCOLOGY, PEDIATRICS,
NEUROLOGY, DERMATOLOGY, LARYNGOLOGY,
OPHTHALMOLOGY, AND OTOTOLOGY,

BY

PROFESSORS AND LECTURERS IN THE LEADING MEDICAL
COLLEGES OF THE UNITED STATES, GREAT
BRITAIN, AND CANADA:

EDITED BY

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PREFACE.

It is proposed to make this periodical a complete post-graduate course of medical instruction. The rapid strides with which our profession is moving towards the goal of an exact science have brought into greater prominence the clinical teacher. The didactic professor presents in a formal and well-considered manner the position of the science of medicine in its most advanced stage, as to the study of disease and the methods of its detection, prevention, and cure; the clinical teacher supplements the course of instruction by making practical these formularies and applying them, in the presence of the student, to the individual case. The one deals with the science, the other with the art. To those who are unable to attend a course of clinical instruction and learn directly from the bedside the very latest methods for the detection and cure of disease, the stenographic reports from the ward or amphitheatre, corrected by the teacher himself, will vividly portray the picture as presented to the class, and thus at a distance they can benefit by the instruction. It will be the aim of the editors to publish only such lectures as are most instructive and most practical. The large amount of material which they receive from the stenographers is carefully read, and those lectures which appear to them to be most useful are returned to the lecturers for their revision, with any suggestions that seem to be necessary, and this matter then classified will appear quarterly. In a number of instances articles containing illustrative cases have been written especially for publication in the series. It will be the endeavor of the editors to represent all well-known colleges of medicine and hospitals of the United States, Great Britain, and Canada, through their most prominent teachers, and to cover the whole field, if not in each number, at least during the year. The excellence of the articles in this, the first of the series, indicates the interest which the undertaking has awakened in the contributors, and should be a guarantee of its success.

The editors desire to express their obligation to Dr. Frederick A. Packard, of Philadelphia, for his very able assistance in the editorial management, and to Dr. W. W. Bulette for many valuable suggestions, and for his efforts in establishing this journal.

CONTENTS OF VOLUME I.

	PAGE
ACROMEGALY. By JAMES ROSS, M.D., LL.D., F.R.C.P., Physician to the Manchester Royal Infirmary and Joint Professor of Medicine in Owens' College, Manchester	1
POLYÆMIA OR PLETHORA IN ITS RELATION TO INFLAMMATION AND THE TREATMENT OF PATHOLOGICAL PROCESSES IN GENERAL. By WILLIAM HENRY PORTER, M.D., Professor of Clinical Medicine and Pathology in the New York Post-Graduate Medical School and Hospital	19
ANGINA LUDOVICI IN ITS RELATION TO DIPHTHERIA. By JAMES FINLAYSON, M.D., Physician to the Glasgow Western Infirmary, and to the Royal Hospital for Sick Children, Glasgow	30
SORE THROAT. By CHRISTOPHER HEATH, F.R.C.S., Surgeon to University College Hospital; Holmes Professor of Clinical Surgery in University College, London	35
THE TREATMENT OF COUGH IN PHTHISIS. By J. MITCHELL BRUCE, M.A., M.D., F.R.C.P., Physician to Charing Cross Hospital, and to the Hospital for Consumption, Brompton	43
PNEUMONIA; CIRRHOTIC KIDNEY AND LIVER; FIBROID DEGENERATION OF THE HEART. By ALFRED L. LOOMIS, M.D., Professor of Medicine in the Medical Department of the University of the City of New York	53
HYDROTHORAX (PYOTHORAX?) WITH DEXIOCARDIA. By W. T. GAIRDNER, M.D., LL.D., Professor of Medicine in the University of Glasgow, Physician to the Western Infirmary, etc.	62
A CASE OF ENLARGED LIVER WITH JAUNDICE. By RICHARD LEA MACDONNELL, B.A., M.D., Professor of Clinical Medicine in the McGill University; Physician to the Montreal General Hospital	76
URÆMIC CONVULSIONS; EPILEPSY; DYSPHAGIA, DUE PERHAPS TO THE PRESSURE OF A STRAY THYROID GLAND. By FREDERICK C. SHATTUCK, M.D., Professor of Clinical Medicine in Harvard University; Visiting Physician to the Massachusetts General Hospital, etc.	84
MODERN METHODS IN SURGICAL OPERATIONS. By W. W. KEEN, A.M., M.D., Professor of the Principles of Surgery in the Jefferson Medical College	102
ULCERS. By D. W. CHEEVER, M.D., Professor of Surgery in the Harvard Medical School	107

	PAGE
ON A CASE OF INJURY OF THE HEAD. By J. W. HULKE, F.R.C.S., F.R.S., Senior Surgeon to the Middlesex Hospital; Consulting Surgeon to the Royal London Ophthalmic Hospital	118
SCIRRHUS OF THE BREAST; EPIPHYSEAL FRACTURE OF THE UPPER END OF THE HUMERUS. By CHARLES T. PARKES, M.D., Professor of Surgery in the Rush Medical College; Surgeon to the Presbyterian, St. Joseph's, and Augustana Hospitals; Surgeon in the Chicago Polyclinic	128
WYETH'S HIP-JOINT AMPUTATION IN A CASE OF CYSTIC SARCOMA OF THE THIGH. By J. McFADDEN GASTON, M.D., Professor of the Principles and Practice of Surgery, Southern Medical College, Atlanta, Georgia	182
CANCER OF THE PENIS. By W. H. CARMALT, M.D., Professor of Sur- gery in the Medical Department of Yale University	188
ABDOMINAL NEPHRECTOMY FOR PYELONEPHROSIS. By C. B. NANCREDE, M.D., Professor of Surgery and Clinical Surgery in the Uni- versity of Michigan	144
CHOLELITHIASIS: WITH SPECIAL REFERENCE TO ITS SURGICAL TREATMENT. By A. W. MAYO ROBSON, F.R.C.S., Professor of Surgery in the Yorkshire College, Honorary Surgeon in the Leeds General Infirmary; Examiner in the Victoria University; Honorary Consulting Surgeon in the Batley Hospital	148
THE EARLY DIAGNOSIS OF PREGNANCY. By MATTHEW D. MANN, A.M., M.D., Professor of Obstetrics and Gynecology in the Medical De- partment of the University of Buffalo; Gynecologist to the Buffalo Gen- eral Hospital	160
ELEVATION OF TEMPERATURE DURING THE PUERPERAL PERIOD. By J. CHALMERS CAMERON, M.D., M.R.C.P.I., Professor of Obstetrics, McGill University	164
SYPHILITIC ULCER OF THE VULVA; OVARALGIA, SPINAL IRRITATION, AND ANÆMIA. By THEOPHILUS PARVIN, M.D., Professor of Obstetrics and Diseases of Women and Children, Jefferson Medical College	176
URETHRITIS; DILATATION OF THE URETHRA; SOUNDING OF THE URETERS; ANTERIOR ELYTRORRHAPHY; A NEW METHOD OF PERFORMING LATERAL ELYTRORRHAPHY. By HENRY T. BYFORD, M.D., Professor of Gynecology, Chicago Post- Graduate Medical School; Professor of Clinical Gynecology, Woman's Medical College of Chicago; Gynecologist to St. Luke's Hospital; Sur- geon to the Woman's Hospital	182
CANCER OF THE VAGINA; RETAINED PLACENTA AFTER MISCARRIAGE; TUBO-PAROVARIAN CYST. By WILLIAM GOODSELL, M.D., Professor of Gynecology in the University of Pennsyl- vania	189
TONSILLAR DIPHTHERIA. By F. FORCHHEIMER, M.D., Professor of Physiology and Clinical Diseases of Children in the Medical College of Ohio, Cincinnati, Ohio, etc.	195

	PAGE
DIFFERENT TYPES OF PARALYSIS IN YOUNG CHILDREN. By LANDON CARTER GRAY, M.D., Professor of Diseases of the Nervous System, New York Polyclinic	204
CHOREA. By SIR DYCE DUCKWORTH, M.D., LL.D., Physician to and Lecturer on Medicine in St. Bartholomew's Hospital; President of the Clinical Society; Honorary Physician to H. R. H. the Prince of Wales . .	218
THE REMOTE EFFECTS OF TRAUMATISMS AS SEEN BY THE NEUROLOGIST. By H. C. WOOD, M.D., LL.D. (Yale), Clinical Professor of Nervous Diseases in the University of Pennsylvania	225
FUNCTIONAL NERVOUS TROUBLES: NEURASTHENIA, ITS OCCURRENCE IN YOUNG AND OLD, SYMPTOMATOLOGY, AND TREATMENT. By B. SACHS, M.D., Professor of Mental and Nervous Diseases in the New York Polyclinic; Neurologist to the Montefiore Home for Chronic Invalids	237
MYOTONIA AND ATHETOID SPASM. By CHARLES K. MILLS, M.D., Neurologist to the Philadelphia Hospital and Professor of Diseases of the Mind and Nervous System in the Philadelphia Polyclinic	247
ALCOHOLIC PARALYSIS. By DAVID FERRIER, M.D., F.R.S., F.R.C.P., Professor of Neuropathology in King's College, London; Physician to King's College Hospital, and to the National Hospital for the Paralyzed and Epileptic.	265
THE TREATMENT OF OBSTINATE SCIATIC PAIN BY SPLINT-REST AND COLD. By S. WEIR MITCHELL, M.D., LL.D. (Harvard). Professor of Diseases of the Mind and Nervous System in the Philadelphia Polyclinic	277
STRICTURE OF THE LARYNX. By J. SOLIS-COHEN, M.D., Honorary Professor of Laryngology, Jefferson Medical College, Philadelphia	285
PSORIASIS. By GEORGE HENRY FOX, M.D., Clinical Professor of Diseases of the Skin in the College of Physicians and Surgeons of New York . . .	298
INFANTILE ECZEMA. By A. H. OHMANN-DUMESNIL, M.D., Professor of Dermatology and Syphilology in the St. Louis College of Physicians and Surgeons	306
XANTHOMA; LICHEN PLANUS; CONGENITAL ALOPECIA; SYPHILITIC TUBERCLE. By JAMES NEVINS HYDE, A.M., M.D., Professor of Skin and Venereal Diseases in the Rush Medical College, Chicago; Dermatologist to the Presbyterian and Michael Reese Hospitals, Chicago	316
ASTIGMATISM: A VERY COMMON AND OFTEN UNRECOGNIZED CAUSE OF HEADACHE. By JULIAN J. CHISOLM, M.D., Professor of Eye and Ear Diseases in the University of Maryland, and Surgeon-in-Chief to the Presbyterian Eye, Ear, and Throat Charity Hospital of Baltimore City	328
STUBBORN INFLAMMATIONS OF THE EXTERNAL AUDITORY CANAL. By ALBERT H. BUCK, M.D., Clinical Professor of Diseases of the Ear in the College of Physicians and Surgeons, New York; Consulting Aural Surgeon to the New York Eye and Ear Infirmary	340

LIST OF ILLUSTRATIONS TO VOLUME I.

PLATES.

	PAGE
Acromegaly, showing the General Expression and the Disproportionate Size of Hands facing	4
Acromegaly, showing Dorso-Cervical Kyphosis "	4
Acromegaly, showing General Increase in Size with Broadening of the Fingers of the Left Hand "	6
Acromegaly, showing Marked Increase in the Size of the Feet and Abnormal Position of the Toes "	6
Perimetric Tracings of the Fields of Vision in a Case of Acromegaly "	8
Osteo-sarcoma of Femur "	186
Temperature Charts of Fever during the Puerperium between 168 and 169	
Method of rising from a Chair, seen in a Case of Myotonia facing	250
Method of closing the Mouth, seen in a Case of Myotonia "	250
Appearance of Patient suffering from Athetoid Spasm and Myotonia on endeavoring to open the Mouth "	259
Psoriasis "	299
Psoriasis "	300

FIGURES.

Perforation of the Pleura in a Case of Phthisis Pulmonalis	69
Pleural Adhesions anticipating Perforation of the Visceral Pleura	72
Partial Sealing of a Perforation in the Pleura	72
Enlarged Liver	80
Method of applying the Sheet as an Apron in Surgical Operations	103
Ligature Case	105
Method of inserting Needles and applying Rubber Band in Wyeth's Amputation	133
Application of Sutures in performing Anterior Elytrorrhaphy	184
Field of Vision in a Case of Hysterical Hemianopsia	233
Ice-splint for the Treatment of Sciatica	230
Tracheotomy Tubes	239
Larynx after Treatment of Stricture by Dilatation	292
Mackenzie's Laryngeal Dilator	294
Cohen's Laryngeal Dilator	295
Schrötter's Perforated Laryngeal Dilator	296
Card for the Detection of Astigmatism	335
Astigmatic Card with Two Sets of Lines	336
Astigmatic Card with Single Set of Lines	337

Medicine.

ACROMEGALY.

A CLINICAL LECTURE.

BY JAMES ROSS, M.D., LL.D., F.R.C.P.,

Physician to the Manchester Royal Infirmary and Joint Professor of Medicine in
Owens' College, Manchester.

GENTLEMEN,—As I have under my care in Queen Ward at present an example of a somewhat rare disease, I am unwilling to allow the opportunity to pass without bringing the patient formally under your notice. I have said that the disease is a rare one, but perhaps it would be more accurate to say that it has rarely been described. The patient which I shall immediately bring under your observation is, so far as I can ascertain, only the seventh case of the kind reported in this country, and the authors who have laid the foundation of our knowledge of the disease have been able to collect only about forty cases from the whole field of medical literature. It must, however, be acknowledged that, attention having once been directed to the leading features of the disease, examples of it may not prove to be so rare as is at present supposed. At least this has been the history of other newly-described diseases of which disseminated sclerosis may be quoted as a notable instance.

I now introduce the patient to your observation. You will at once notice the prominence of the orbital arches, the large size of the nose, the great thickness of the under lip, the enlargement of the tongue in all its dimensions, the massiveness of the lower jaw, the projection of the chin, and the enormous comparative size of the hands and feet. The enlargements of these parts—all of which may be regarded as belonging to the extremities of the body—you perceive at a glance. It is possible, indeed, that they do not constitute the most important part of the disease so far as its pathology is concerned, but they give to it its most striking and characteristic features, and consequently Marie, who was the first to give a detailed description of the affection and to recognize that this group of symptoms constituted a separate disease,

has bestowed upon it the name of "acromegaly" (*ἄκρον*, extremity, and *μέγα*, large). As a clinical term I make no objections to it. Such a name, however, is applicable only to a disease of which our knowledge has not yet passed beyond the descriptive stage, and, if ever the time arrives at which we shall attain to an understanding of the hidden causes and intimate nature of the affection, this term, you may be sure, will disappear from our nosology. Now, although Marie was the first to recognize the disease as a morbid entity, yet it must be acknowledged that several cases of the affection had, under various names, been already described by previous authors. Two cases were reported by Friedreich under the title of "Hyperostosis of the Whole Skeleton," one by Fritsche and Klebs under the name of "Gigantism" (*Riesenswuchs*), one by Lambroso as "General Hypertrophy" or "Macrosomia," and one by Henrot under the category of "Myxœdema." But this does not in the slightest degree detract from the merit due to Marie in being the first to recognize the disease and to give of it a detailed description, a description which has now become classical, of which the highest praise I can bestow upon it is to say that for dramatic power and faithfulness to fact it is in all respects worthy of the great school of the Salpêtrière.

This patient attended the Royal Infirmary during the last twelve months as an out-patient, under the care of my colleague, Dr. Judson S. Bury, and it is through his kindness that she has found her way to my ward. The notes of the case, which I shall now read, were taken by my clinical clerk, Mr. C. C. Preston.

Annie H., aged twenty-three years, was admitted to the Manchester Royal Infirmary on November 26, 1890.

The patient is unmarried, and by occupation has been a general servant, but has not been able to go out to service for the last three years. She has always lived under fairly healthy conditions, has been well clothed and fed, and never gave way to alcoholic or other excesses. No history of gonorrhœa or syphilis can be obtained. The patient's father and mother are living and healthy. She has also two healthy sisters, and these with herself comprise all the children of their parents, none having died in infancy. Her father's brother died of consumption, but she does not know the cause of death of any other of their relations. None of her relatives, so far as she can learn, have suffered from symptoms at all like her own, and none of them have been the subject of enlarged neck (goitre).

Until the commencement of her present illness the patient had always enjoyed excellent health. She thinks she had an attack of

scarlet fever when a child, and four years ago she was in bed for over a week from a feverish cold which was accompanied by pains in the limbs, but she soon recovered completely. At thirteen years of age she began to menstruate, and was quite regular until three years ago, when the flow suddenly ceased and has not since returned. Soon after menstruation had ceased the patient began to suffer from headaches. The pain is hardly ever absent, and is localized chiefly in the left temple, but the headache is liable to paroxysmal exacerbations, during which the pain radiates across the forehead, to the vertex, and in all other directions. The headache is not more severe at night than during the day, and only occasionally prevents her from sleeping.

Soon after menstruation had ceased she noticed that her hands and feet were gradually increasing in size, and discovered that she required gloves and shoes several sizes larger than formerly in order to fit her. Her abdomen has become large and protuberant, and she thinks herself somewhat stouter generally than she was before her illness began, but she is certain that she has not increased in height since she was eighteen years of age. Her limbs also do not appear to have increased in length.

For the last eighteen months she has found that her sight has been gradually failing. The failure of sight has crept on gradually, and in such a way that she sees objects situated to her left side better than those on her right. For the last few months the sight of the left eye has failed so much that she can now hardly discern anything in front of her when the right eye is closed.

The patient complains of a feeling of lassitude, and of being apathetic and disinclined to hurry herself about anything. At one time she was active and energetic, but for the last three years she cannot throw any vigor into her work, and requires a long time to do a simple piece of sewing. She is very slow in all her movements, her speech is measured, her ideas seem to flow in a slow and hesitating manner, and she states that her memory is very defective, but her mental condition is probably one in which one idea is slow to suggest another rather than one of actual loss of memory.

Present Condition.—As the patient lies in bed her face presents certain characteristics which are sure to attract the attention of a careful observer. The face is very pallid, the features are coarse and prominent, and the expression is dull, sleepy, and apathetic (see Figs. 1 and 2). The head is covered by a dense mass of coarse, dark-brown hair, the front part of which is frizzled so that it covers nearly the whole of her low, narrow, and retreating forehead, and thus the lower

part of the face, which is actually much elongated, appears to be of monstrous length when compared with the part above the eyebrows. The forehead is, as we have said, retreating, but this results chiefly from the great prominence of the orbital arches, which, when combined with the low character of the brow, causes it to slant rapidly backward. The eyes are deep set at their inner angles, but, as the supra-orbital ridges and eyebrows curve upward and outward from the nose, the outer angles are superficial. The palpebral fissures are narrow and elongated, and the eyelids are somewhat thick and full, but not œdematous.

The nose is enormously developed. The root, where the nasal bones are covered only by loose integument, is prominent, and the organ, which is of great length, curves downward and outward until it terminates in a bulbous extremity, which, with the thickened alæ and septum, forms a deformed mass that oversteps the limits of what is usually described as pug-nose.

The lips are thick and prominent, and the mucous membrane covering them is of a bluish-red color and so glazed and comparatively smooth that they have the appearance of being infiltrated or padded, and when the mouth is slightly open, the lower lip, which is much the thicker of the two, becomes everted and protrudes beyond the upper. The malar bones do not seem to have undergone any enlargement, and the cheeks are long, thin, and flat. The ramus of the inferior maxilla appears to be normal in size, but the body forms with it an angle which is very obtuse, and thus the inferior border slants unduly downward and forward to the chin. The symphysis of the lower jaw is very deep, and the chin large and prominent, and, when the mouth is slightly open and the lower lip everted, the lower part of the face has a prognathous appearance. When the jaws are closed, the edges of the lower meet those of the upper incisor teeth, but do not project beyond them. The teeth are well formed and comparatively sound, and are not unduly separated from one another in either jaw.

The tongue appears to fill the whole cavity of the mouth, and on protrusion it is seen to be enormously enlarged in all its dimensions. The dorsum is rough and fissured, and fairly clean.

The larynx is somewhat prominent, but not much enlarged. The voice is deep-toned and monotonous, and the speech is slow and deliberate, but there is no manifest disorder of articulation. The neck is not unduly thick. The right lobe of the thyroid body can be seen and felt as a slight prominence above the clavicle, by the side of the trachea and behind the inferior part of the sterno-cleido-mastoid



FIG. 1.—Acromegaly. Showing the general expression and the disproportionate size of the hands.



FIG. 2.—Acromegaly. Showing dorso-cervical kyphosis.

muscle; but the isthmus, as it passes in front of the trachea, becomes gradually smaller from right to left, and hardly a trace of the left lobe can be discovered.

The following measurements of the head and face have been taken.

	Centimetres.
Circumference of the head	56.0
Length of the head from the forehead (glabella) to the occipital protuberance	19.25
Length from the occipital protuberance to the tip of the chin	24.0
Breadth of the head from mastoid process to mastoid process	12.1
Length from the top of the forehead to the tip of the chin	21.0
Length from the top of the forehead to the upper part of the nasal bones	6.5
Length from the upper part of the nasal bones to the tip of the nose	6.0
Greatest width of the alae nasi	3.75
Length of the nose from the upper lip to the tip	3.5
Length from the septum of the nose to the tip of the chin	8.0
Greatest distance between the outer surfaces of the malar bones	13.0
Width of mouth	5.0
Vertical measurement of lower lip	2.0
Transverse measurement of lower lip	5.0
Thickness of the tongue at its middle	2.5
Length of tongue on protrusion, from lower incisor teeth to the tip	4.0
Lower jaw, vertical measurement from the free border of the gums to the lower part of the symphysis	4.0
Length from the temporo-maxillary articulation to the tip of the symphysis of the lower jaw	17.0
Distance between the two angles of the lower jaw	12.0
Ears, greatest length	6.0
Ears, greatest breadth	3.0

The hands are enormously developed and appear to be enlarged in all their dimensions, although the increase in their breadth is out of proportion to that in their length. The patient states that she now requires gloves several sizes larger than she did three years ago.

The increase in the size of the hands and fingers (see Fig. 3) is due chiefly to enlargement of the bones. There is no thickening of the skin or of the subcutaneous tissue on the backs of the hands and fingers, but in the palms the carpal bones at the ulnar borders are covered by enormous pads of thickened tissue, which extend over the fifth metacarpal bones and hypothenar eminences. The thenar eminences are covered by normal skin and are not themselves enlarged. The fingers are thick and somewhat flattened antero-posteriorly, but apart from their great size, there is no manifest deformity. The nails

are broad, short, and flat, and of a rosy tint. They are, however, smooth with the exception of the nails of the thumbs, which are fissured vertically near their free borders. The lower extremity of the radius on each side appears to be enlarged, and the wrist is broad and thick in comparison with the size of the forearm as a whole. The upper extremities of the radius and ulna and the humerus do not appear to be affected.

The following measurements were taken, and as the limbs are symmetrically affected, the dimensions of one side only will be given.

	Centimetres.
Length of the arm from the acromion process to the olecranon . .	85.0
Circumference of the arm at its middle	28.0
Length of the forearm from the olecranon process to the styloid process of the ulna	25.5
Circumference of the forearm at its middle	23.0
Circumference of the wrist	18.0
Length of the hand from the wrist to the tip of the middle finger	20.0
Length of middle finger from the palmar fold to the tip	9.0
Length of middle finger on dorsum from metacarpo-phalangeal joint to tip	11.0
Length of the little finger on palmar aspect	6.0
Length of thumb on dorsum from metacarpo-phalangeal joint to tip	7.0
Circumference of the middle finger	7.0
Circumference of the little finger	6.0
Circumference of thumb	7.5
Antero-posterior diameter of middle finger	2.0
Lateral diameter of middle finger	2.5
Length of the nail of middle finger	1.5
Breadth of the nail of middle finger	1.5
Length of nail of thumb	1.75
Breadth of nail of thumb	1.75
Circumference of hand (without thumb)	20.5
Circumference of hand (obstetrical position) with thumb	24.0
Breadth of hand at metacarpo-phalangeal joints	9.0

The feet are very large (see Fig. 4), and the patient states that for the last two years she has frequently had to change her boots for a larger size. The small toes are strongly flexed at the respective joints so that their tips are directed towards the soles, and thus their great comparative dimensions are to some extent masked. When, however, one of them is seized by the tip and drawn forward so that the phalanges are held in a line with one another and with the corresponding metatarsal bone, it is then found to be of great relative length. The great flexion of the small toes has doubtless been caused by the wearing of boots much too small for the size of the feet, this view being



FIG. 3.—Acromegaly. Showing general increase in size with broadening of the fingers of the left hand.



FIG. 4.—Acromegaly. Showing marked increase in size of the feet and abnormal position of the toes.

confirmed by the fact that the dorsal surface of each proximal phalangeal joint is covered by a thick callosity or corn. The bones of the small toes have no doubt increased in thickness as well as in length, but their breadth is not a striking feature of the deformity, although each of them terminates in a bulbous extremity. The big toes are enormously enlarged in length and thickness. The first phalanx is in line with the metatarsal bone, but the second phalanx, and with it the nail, is curved upward so that the pulp of the tip is directed well forward when the foot is planted on the ground. This deformity appears as if it were caused by the projection of the toe against the tip of a boot too short for the dimensions of the foot. The heel is covered on its posterior and inferior and lateral surfaces by an enormous pad of elastic tissue, which extends forward along the outer border of the foot to near the little toe, but there is no great increase of the soft tissues of the remaining parts of the foot. The anterior surface of the patella is also covered by a thick pad of elastic tissue. The patella itself does not appear to be enlarged, but the pad in front of the bone, which is about three-quarters of an inch thick, renders each knee very prominent in front. The femur and the tibia and fibula do not appear to be altered in size, and although the malleoli are somewhat prominent, they are not so much enlarged as to present any deformity, especially when they are compared with the great size of the foot. The following measurements have been taken :

	Centimetres.
Length of the thigh from the iliac crest to the head of the fibula .	48.0
Circumference of the thigh at its middle	44.0
Circumference of the knee round the middle of the patella . . .	84.0
Vertical diameter of the patella	7.0
Transverse diameter of the patella	7.0
Length of the leg from the head of the fibula to the tip of the external malleolus	41.0
Greatest circumference of the calf	29.0
Circumference of the ankle just above the tip of the internal malleolus	23.5
Greatest length of the foot	27.0
Circumference over the heel and instep	83.0
Circumference of the foot over back of toes	23.0
Greatest width of the foot	10.0
Circumference of the great toe	10.0
Circumference of the middle toe	6.0
Circumference of the little toe	5.0
Length of the nail of the big toe	1.5
Breadth of the nail of the big toe	2.0
Length of great toe from proximal joint to tip	7.5
Length of second toe from proximal joint to tip.	6.25

When the patient stands, the feet become very flat, and the gait is waddling and clumsy, but there is no evidence of weakness of any of the muscular groups.

The patient in the erect posture presents a well-marked forward curvature of the upper dorsal and cervical vertebræ (dorso-cervical kyphosis) (see Fig. 2) combined with a distinct lateral deviation to the right (cervical scoliosis). The head, instead of being erect, is inclined forward, and the face is directed forward and downward, so that the chin approximates the sternum. The shoulders are held well back, so that a plumb-line let fall from the most prominent of the dorsal vertebræ clears the sacrum by about an inch, and thus the patient presents a fairly well-marked lordosis which is doubtless compensatory to the forward deviation of the dorso-cervical vertebræ.

The chest is very prominent in front, and the antero-posterior diameter is large as compared with the lateral one, but neither the chest as a whole, nor the ribs and costal cartilages, present any other deformity, and the xiphoid cartilage is not enlarged. The mammary glands are soft and of moderate size, and the nipples are small and undeveloped. The shoulders are prominent, and the clavicles are large, but the right is considerably thicker at its middle and at its acromial extremity than the left. The shoulder-blades are not appreciably altered. The chest is everywhere resonant to percussion except over the præcordial region, where the dull area is of normal extent, and over the upper part of the sternum, in which there is an area which is distinctly dull to percussion. This area reaches at its upper limit to near the top of the sternum, and at its lower joins the cardiac dulness. It extends about three-fourths of an inch to the left of the left edge, and one-fourth inch to the right of the right edge of the sternum. On stethoscopic examination no abnormal sounds are heard with respiration and the heart-sounds are clear and free from murmur. The abdomen is large and pendulous and its walls are very thick, while well-marked lineæ albicantes are seen over its lower and lateral aspects, although the patient has not been pregnant. No enlargement of the spleen can be discovered by percussion or palpation, and the liver also is normal in size. The bowels are somewhat tympanitic, but the stomach is not dilated, and no enlarged glands or other tumor can be discovered in the abdomen by palpation. The pelvis is capacious, but it is not enlarged to a degree that could be considered abnormal.

The muscular groups of the limbs are fairly voluminous, but they are very soft and flabby, and although the patient possesses fair strength

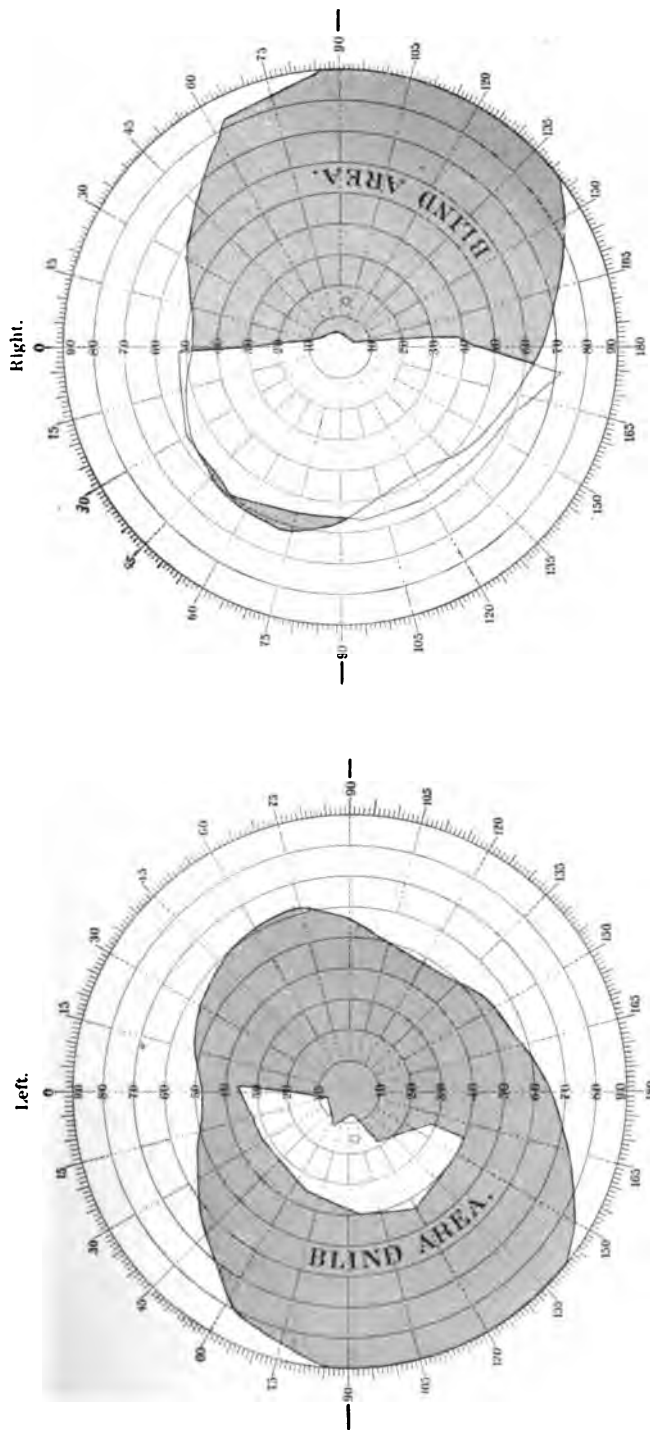


Fig. 5.—Perimetric tracing of the fields of vision of Annie H.

as tested by grasp and opposing actions, yet her motor power is by no means equal to what might be anticipated from the size of her limbs.

The knee-jerks are normal and the cutaneous reflexes, although somewhat sluggish, can be obtained.

The following measurements were taken.

	Centimetres.
Height of the patient	177.0
Circumference of the neck between the hyoid bone and the upper part of the thyroid cartilage	83.0
Circumference of the chest on a level with mammae	94.0
Difference in circumference of chest between the maximum inspiration and maximum expiration	4.5
Antero-posterior diameter of the chest	31.0
Lateral diameter of the chest	29.0
Circumference of the body on a level with the umbilicus	89.0
Circumference of the pelvis on a level with the antero-superior spines of the ilia	98.5

The patient weighs one hundred and sixty-seven pounds.

Disorders of general sensibility are almost entirely absent. The patient suffered from some pains in her joints at an early period of the disease, but she now complains only of a feeling of fatigue on slight exertion. Throughout the whole course of the affection she has been the subject of headache, which rises sometimes to great intensity, and is at other times moderate in degree, but is hardly ever wholly absent. There is a patch of skin over the left temple in which sensation is somewhat blunted, and the patient sometimes complains of tingling and other *paræsthesiæ* in the extremities, but with these exceptions there are no disorders of cutaneous sensibility. The senses of taste, smell, and hearing, if not very acute, are not very defective. The sense of sight is, however, profoundly affected. The right eye is the subject of a clearly-defined temporal hemianopsia, while the left is not only the subject of a nasal hemianopsia, but the temporal half is encroached upon so much that only a portion of the upper and outer part of the field is left. In the left eye the central part of the field is lost, so that when the right eye is closed, the patient cannot see any object in front of her. The annexed perimetric tracings (Fig. 5) illustrate the state of the patient's vision. The optic disks are found to be normal on ophthalmoscopic examination. The patient states that she has no appetite for her food, but she takes a fair amount of ordinary diet, and beyond some feeling of distention, which is probably the result of constipation from which she suffers, does not appear to have any other discomfort.

She says that occasionally she is very thirsty, but thirst is not a prominent symptom, and she does not appear to drink a large quantity of fluid. The pulse beats ninety in the minute, and is small and somewhat hard. The temperature is 97.8° F.

The urine has a specific gravity of 1035 and deposits a large quantity of pinkish urates on cooling, which are redissolved by heat. It does not contain either albumin or sugar. The patient was ordered a generous diet and a mixture of tincture of iron combined with sulphate of magnesia.

December 23.—The symptoms have not undergone much change since last report. She states that she has been more free from headaches since her admission than before, but to-day she has suffered from a severe paroxysm. The pain is localized over the left temple and frontal eminence, but she says that it radiates down the back of the ear and along the course of the left sterno-cleido-mastoid muscle.

December 26.—Her headache is much better to-day and she looks more cheerful than she did two days ago. The specific gravity of the urine to-day is 1045, and it deposits a large quantity of urates.

December 27.—The specific gravity of the urine is 1045 and it is now found to contain a considerable quantity of sugar.

December 30.—The urine gives marked reduction of Fehling's solution, and Dr. Williamson obtained a large number of yellow crystals by the hydrazin test.

January 9. The electrical reactions of the nerves and muscles were examined by Dr. Williamson. He found that a faradic current of very feeble strength to the seventh nerve caused contractions of the muscles, but a stronger galvanic current was required to cause a minimum contraction than in two other patients lying in adjacent beds. Normal electrical reactions were obtained in other nerves and muscles. Dr. Lloyd Roberts reports that the vulva and clitoris are somewhat enlarged, the vagina is of normal dimensions, and the uterus undersized. Sugar persists in the urine.

General Description.—You will notice that in our patient the remarkable deformities, and other phenomena which you have just observed, have crept on gradually and silently, and that the onset of the symptoms had not been preceded by any noteworthy event in the patient's history or surroundings; no circumstance, in short, which could with any show of probability be regarded as either the exciting or predisposing cause of the affection. With regard to the predisposing causes of the affection, by far the greater part of our information is purely negative, and may be briefly comprised in the following

propositions : the disease is not congenital, inheritance does not appear to play any part in its production, the sexes are attacked in about equal proportions, and it is pretty uniformly spread among all civilized races, while so far as the uncivilized races are concerned our knowledge is as yet too scanty for them to enter into the comparison.

As for the exciting causes, mental depression has been mentioned in one case (Péchadre), exposure to cold in three (Marie, Verstraeten), a fall or other injury in two (Marie, Minkowski), rheumatism and gout in four (Sonza-Leite, Marie, Hadden and Ballance, and Godlee), syphilis in three (Marie, Brigidi), alcoholism in one (Brigidi), scarlatina in one (Hadden and Ballance), and intermittent fever with bronchorrhagia in one (Wilks). A simple enumeration of the various diseases which have been noted as antecedents to acromegaly will convince you that none of them is essential to its production, or can be regarded with certainty as even an exciting cause. The disease began in our patient at twenty years of age, and in by far the majority of cases the onset of the symptoms has been observed between the ages of nineteen and twenty-six years. In a case reported by Freund the increase in the size of the extremities was first noticed at fifteen years of age, about a year after menstruation had become established, but in a case recorded by Erb the first indications of the affection were observed at the menopause, and when the patient was forty-eight years of age. Putting aside these extreme cases, it may be said that the affection usually begins at the age of adolescence, and this is the only proposition which can at present be made with any degree of confidence regarding the etiology of the affection.

Symptoms.—This disease is one which does not come under the observation of the physician until the symptoms are well advanced, and consequently our knowledge of the early indications of the affection have had to be gathered from the uninstructed statements of the patients and their friends. The laity will necessarily attach the greatest importance to the most obvious symptoms, and thus the striking phenomena of the progressive increase in the size of the hands and feet, the changes in the features of the face, and in women the sudden arrest of menstruation are not unlikely to assume in their minds an undue importance, and it is possible that an attentive study of the affection at its inception may lead to these symptoms being relegated to a secondary position. A gentleman, aged about forty years, consulted me a short time ago for continuous headache and a peculiar defect of vision which, he said, “seems to puzzle several oculists I have consulted, both in this country and abroad.” His visual defect I found to be a mod-

erately defined bitemporal hemianopsia; the media were transparent and the optic disks were normal. The case was clearly one of compression of the optic commissure by a tumor. The contour of that patient's face reminded me forcibly of the countenance of our present patient. His forehead was retreating, his nose long and prominent, although not thickened, and the lips had the same bluish-red, glazed, padded appearance as those you have just seen, with a tendency for the lower to become everted and to project beyond the upper when the mouth was slightly open. The larynx was prominent and the left lobe of the thyroid body could be felt as a small swelling of normal size by the side of the trachea and behind the inferior third of the right sterno-cleido-mastoid muscle, but not a trace of the right lobe could be discovered, and the isthmus felt like a thin riband in front of the trachea. I could not discover any post-sternal dulness in the upper part of the chest. His hands were broad and somewhat stumpy, and the nails were flat and broad in comparison to their length, but the patient assured me that neither hands nor feet had increased in size, and that he had not had, since he was a young man, to change the size of his gloves or of his boots. The patient suffered from headache and attacks of palpitation, while he often passed a large amount of limpid urine. The urine was of specific gravity 1010, and was free from albumin and sugar. Is this gentleman, then, suffering from the early symptoms of acromegaly? I do not know. The association of symptoms in this case is, however, well calculated to make us ponder, and ask ourselves if it be not possible that morbid alterations of the thyroid body, the pituitary body, and the thymus, those ductless glands whose functions are so obscure and yet so important, may constitute the initial and essential phenomena of the disease, and that the changes in the size of the extremities and in the bones of the trunk may hereafter be relegated to a secondary and subordinate position. In the mean time the physician must follow the lead of the laity in placing the increased size of the extremities and the distortions of the vertebral column in the first order of importance and in the forefront of his descriptions of the disease. But time presses, and I must now limn the picture in broad lines.

The hands, which have been aptly compared to battledoors, are enormously developed, and, their width being out of proportion to their length, they have a *stumpy* appearance. The fingers are "sausage-shaped," somewhat flattened antero-posteriorly, and the palmar lines are well-marked, often deep and bordered by thick folds. The soft parts are also hypertrophied, and a mass of dense tissue lies in front of

the carpal bones at the ulnar border of the hand, and extends forward on the fifth metacarpal bone and the hypothenar eminence. The nails are flattened, wide in comparison to their length, of a rosy tint, and striated longitudinally. The wrists are somewhat increased in size, but the arms and forearms maintain their usual size and often appear abnormally small when compared with the enormous development of the hands.

The feet are also enormously increased in size. The malleoli are enlarged, and the posterior surfaces and external borders of the heels are covered by a loose mass of hypertrophied tissue which extends forward along the outer borders of the feet. The toes are increased in size in all their dimensions and the thickness of the big toes is developed to such a degree that it is out of all proportion to the increase in their lengths. The tendo Achillis is occasionally increased in size. The upper extremity of the tibia and the head of the fibula are at times enlarged, and the patella is occasionally enlarged in all its dimensions, but most frequently the bone is covered, as in our case, by a dense mass of hypertrophied tissue, which renders the contour of the knee very prominent in front. The joints of the hands and feet are often large, somewhat nodose, and the seats of crackling on passive movements. The distal phalangeal joints are particularly liable to be enlarged, and in these cases the nails are apt to become curved longitudinally and laterally so as to resemble the beak of a paroquet seen in profile, and the fingers have then been aptly said to assume the form of a drumstick. Marie has made an attempt to separate these cases from acromegaly and to comprise them under a category of their own under the name of *ostéo-arthropathie hypertrophique ante-pneumonique*. The grounds for calling the affection of the limbs in these cases *hypertrophic osteo-arthropathy* are not far to seek and need not be dwelt upon here, but the reason for adding the adjective *pulmonary* demands explanation. This adjective is added by Marie on the hypothesis that the deformities of the ends of the fingers in these cases is produced by a process analogous to that which produces the bulbous finger-tips and curved nails in phthisis. I can find no warrant for this theory in the facts, but even if this hypothesis were a plausible one, I should object to its being included in the name of the disease. This is begging the question which has to be proved, and to place an hypothesis of this kind in the definition of the disease is an offence against the laws of scientific terminology and classification. Gentlemen, I would advise you to disregard this distinction. I can see nothing in the history, symptoms, and course of the cases in which the joints are nodose and

the nails beaked to justify their separation from the cases in which the joints are not enlarged and the nails are flattened.

The head and face undergo important alterations. The cranium is not much altered in size, but it is sometimes elongated in the antero-posterior diameter. The forehead is low, and slanting forward from above downward owing to the undue prominence of the orbital arches caused by dilatation of the frontal sinuses. The eyelids are often thickened and their tarsal cartilages are at times hypertrophied. The palpebral fissures are generally narrow and elongated, but occasionally there may be a slight degree of exophthalmos. The face is elongated vertically, and, the cheeks being flattened, the face has the form of an elongated oval. The nose is enlarged in all its dimensions and the alæ and tip are much hypertrophied. The upper lip is somewhat plump, but the lower lip is enormously thickened, and, becoming everted and protuberant when the mouth is slightly open, it imprints upon the countenance one of the most characteristic features of the disease. The cheek-bones are sometimes prominent owing to dilatation of the maxillary sinuses, but this increase in size is usually masked by the elongation of the face. The lower jaw is uniformly changed both in size and form. The angle formed by the ramus with the body of the bone becomes very obtuse, and the lower border of the body slants unduly downward and forward. The chin is large and massive, and projects downward and forward. The distance between the alveolar border and the tip of the chin is increased, and, as the bodies of the bones become enlarged in all their dimensions, the teeth are carried forward so that the lower often project beyond the upper incisors, and thus a marked degree of prognathism is produced.

The upper surface of the tongue is generally rough and fissured, and the organ is enormously enlarged in all its dimensions, but it retains its regular shape. The ears often retain their normal size, but at times they are notably enlarged. The condition of the spinal column demands special attention. In all cases there is a marked kyphosis of the upper dorsal and cervical vertebræ, and very often there is some degree of scoliosis, but it is always less marked than the forward curvature. When the patient stands, the forward curvature of the upper vertebræ is compensated by a certain degree of lordosis, so that a plumb-line let fall from the most prominent of the dorsal vertebræ clears the sacrum by an inch or more.

The dorso-cervical kyphosis causes the head to be bent forward, and in some cases the distortion is carried so far that the chin almost rests on the sternum. The neck is short and often thick from hyper-

trophy of the cervical tissues, and the clavicles and shoulder-blades being themselves often enlarged and thrust upward, owing to the distortion of the thorax caused by the kyphosis, the head seems often to be buried between the shoulders. The ribs are often increased in size and their cartilages are sometimes developed in such a way as to give the appearance of the rickety rosary. The dorsal curvature also causes the ribs to become unduly oblique and the lower ribs are sometimes forced strongly outward. The circumference of the thorax is increased in size; it is often flattened laterally and becomes very prominent in front, and slants obliquely from above downward and from behind forward, while the xiphoid appendix is often enormously developed and may project beyond the level of the sternum. The changes which the bones of the thorax have undergone are such as to diminish its capacity for expansion, and consequently the breathing is often almost entirely diaphragmatic.

In the early stages of the disease the muscular system is often well developed and the patient is possessed of great muscular strength, but as the disease advances the muscles become flaccid and wasted and the patient's strength sinks below the normal. Erb found that the resistance of the tissues to the passage of electrical currents was less than in healthy people, but this was only found to be true with regard to the faradic current in my case.

The larynx is often augmented in volume, and the organ in women becomes so prominent that it assumes the masculine form. The voice is deep, monotonous, and often disagreeable, while the simultaneous enlargement in the tongue, soft palate, and lips causes the articulation to be slow, thick, and guttural.

The thyroid body is often diminished in size, but probably never entirely absent. In other cases there is a manifest goitre, but this enlargement, instead of representing hypertrophy of the gland, constitutes a manifest destruction of it.

A very interesting phenomenon has been pointed out by Erb in the dull area which is sometimes found in the superior sternal region of the thorax. This area is well-defined in my case and it has also been found by Schultze, Verstraeten, and Marie and Sonza-Leite. It is, according to Erb, caused by the persistence of the thymus gland, enlargement of which has been discovered post mortem. The pituitary body is also often enlarged, but this condition will be immediately described when we come to speak of the disorders of the special senses.

The bones of the pelvis are often enlarged and sometimes deformed. The external organs of generation in the male and in the female are

often enlarged and hypertrophied. The vagina has been found long and capacious, while the uterus is elevated and small, and presents many of the characteristics of senile involution.

The mammary glands are usually soft, small, and atrophied, but the nipples are often large and salient, and generally surrounded by thick and hard hair. The abdomen is often large and protuberant; its walls are thickened and frequently intersected by transverse streaks, or covered by *linæ albicantes*. The pubic hair often extends in the middle line as far as the umbilicus.

The *sensory* phenomena consist of headache, often severe and continuous, at times arthritic pains, and, very rarely, numbness and other *paræsthesiæ*, or even *anæsthesia* or *hyperæsthesia* of the extremities.

In the region of the special senses disorder of sight is by far the most frequent and most important. Sight may be affected in various degrees from slight amblyopia up to complete blindness, but on ophthalmoscopic examination the optic disks are often normal, although occasionally slight congestion or even marked neuro-retinitis has been observed. In a case recorded by Schultze the disorder of sight assumed the form of temporal hemianopsia. In the case which I have just brought before you the visual defect consisted at first most probably of a right-sided homonymous lateral hemianopsia caused by compression of the left optic tract, but now the temporal field of the left half of the chiasma is being subjected to pressure.

Disorders of hearing are occasionally present and consist of tinnitus or slight diminution of the acuteness of auditory perception of one or both ears up to complete deafness. Disorders of the senses of taste and smell have not been mentioned.

The skin is generally dry, flaccid, and of a yellowish-brown-olive color, while it is sometimes the seat of pendulous growths like *molluscum fibrosum*. The surface of the body is often bathed in profuse perspiration on the slightest exertion, and it is often attended by a disagreeable odor. The hair is generally coarse and abundant, and often grows with immense rapidity.

The appetite is sometimes enormous, and the patient is the subject of great thirst. The heart is probably hypertrophied in the early stages of the disease, and the pulse hard, but with the progress of the symptoms it becomes dilated and the pulse becomes small, feeble, and irregular. The patient often appears to suffer from attacks of palpitation. The urine is frequently pale, of low specific gravity, and abundant, while at other times, as in our case, the specific gravity is high and it contains a considerable quantity of sugar. These changes in the

character and quantity of the urine and the attacks of palpitation are probably caused by irritation from the enlarged pituitary body being conducted from the third ventricle through the aqueduct of Sylvius to the fourth ventricle. This supposition is strengthened by the fact that these symptoms have been observed in tumors near the sella turcica which have not been associated with increase in the size of the extremities or the other symptoms of acromegaly.

Psychical symptoms do not constitute a prominent feature of the disease. The patients are generally dull and apathetic, but often their good humor is in marked contrast to their miserable and hopeless condition. Occasionally, however, the patient may become a prey to melancholy which may even lead him to commit suicide.

The course of the disease is always chronic, and the patient may live for twenty years or upward. In the late stages of the disease the patient falls into a condition of progressive cachexia, becomes bed-ridden for some years, and, finally, death occurs somewhat suddenly and unexpectedly from an attack of syncope.

Diagnosis.—The diseases with which it is most likely to be confounded are *myxœdema*, *leontiasis ossea* (Virchow), *osteitis deformans* (Paget), *arthritis deformans*, and *elephantiasis*.

In *myxœdema* the skeleton is not altered in its dimensions, and the face is broad and stupid, and presents, as pointed out by Gull, the appearance of a full moon, instead of the elongated oval seen in this disease.

In *leontiasis ossea* there is a growth of true bony tumors of the face and cranium, instead of the uniformly distributed hyperostosis of this disease, and there is an absence of hypertrophy of the limbs.

In *osteitis deformans* there is hyperostosis of the bones of the cranium, but those of the face are only implicated to a slight degree, while in the limbs the long bones become curved and deformed and the extremities are little if at all affected.

In *arthritis deformans* the joints are nodose and deformed, but there is no increase in the size of the bones, and the face does not undergo the characteristic alterations met with in acromegaly.

In *elephantiasis* the disease consists of hypertrophy with œdema of the skin and subcutaneous cellular tissue; it is usually unilateral, scarcely ever affects the upper limbs, and is never attended by increase in the size of the skeleton.

The changes which have been found post mortem consist of a widely-distributed hyperostosis of the bones of the extremities, cranium and face, vertebral column, and trunk, enlargement of the pituitary

body with compression of the sella turcica and optic commissure alterations of the thyroid body, persistence of the thymus gland, enlargement of the liver, kidneys, and spleen, hypertrophy and in one case atrophy of the heart, hyperplasia and dilatation of arteries, and hyperplasia of the brain and of many nerves, especially of the sympathetic ganglia and cords.

Of the nature of the disease we know nothing beyond conjecture, but I agree with Erb in believing that its nearest allies will be found to be myxœdema and sporadic cretinism, and that the alterations in the bones will prove to be secondary to the morbid alteration in the ductless glands.

Treatment.—With regard to treatment I need say little. Alterative treatment by iodide of potassium, mercury, and arsenic, strengthening treatment by tonics, good diet, and stimulating baths have been tried and found powerless to arrest the disease. Gentlemen, it is well for you to know the extent of your resources. Knowledge is power, even if it be the knowledge of your own powerlessness. If you cannot do anything to help these unfortunate patients by direct and active treatment, you can at least save them from the bleedings and blisterings and other barbarous methods of olden time, and you may often be able to do much in alleviating their condition by shielding them from imputations of laziness, and directing towards them the attention of the kind-hearted and benevolent.

I have not deemed it necessary to give references to authors in this lecture, but a full bibliography will be found in Sonza-Leite's very complete and excellent monograph.¹

¹ Sonza-Leite (J. D.), *De l'Acromegalie*, Paris, 1890.

POLYÆMIA OR PLETHORA IN ITS RELATION TO INFLAMMATION AND THE TREATMENT OF PATHOLOGICAL PROCESSES IN GENERAL.

**CLINICAL LECTURE DELIVERED AT THE NEW YORK POST-GRADUATE MEDICAL
SCHOOL AND HOSPITAL.**

BY WILLIAM HENRY PORTER, M.D.,

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Medical School and Hospital.**

GENTLEMEN,—To-day I propose to discuss with you the general subject of polyæmia. My reason for taking up this condition is that, from a long experience with undergraduate men, I have generally found that they had little or no knowledge of this important subject; while a thorough conception of this question, physiologically applied to our pathological conditions, is absolutely essential if we are clearly to understand inflammation in all of its relations to diseased processes. It also helps to eliminate inflammation where the abnormal action is non-inflammatory in origin, and more concisely defines the condition which justly deserves to be called inflammatory in character. Without an accurate knowledge of plethora our treatment must be largely symptomatic or empirical, but when we clearly understand this department of science our treatment can be based upon well-founded physiological and pathological laws; for by this information we are placed in a position to appreciate symptoms, and to abort their intensity or effect their disappearance. In this way we frequently decrease the strain upon the system, and save many a life that must have perished if we had waited for the symptoms to be developed before treatment was instituted.

The latter method is much like waiting for the fire to reach every floor and burst forth through the roof before sending for the fire department; the former is like summoning the firemen when the first smouldering smoke makes its appearance. This illustrates exactly the difference between symptomatological treatment and that based upon well-defined physiological and pathological laws.

Polyæmia or plethora is best defined as that condition of the system in which there is a superabundance of blood, both as regards quantity and quality. As a result, there is a general hyperæmic or over-filled condition of the vascular system.

Etiology.—Polyæmia may be produced by the removal of a large extremity after the application of an Esmarch's bandage, with only a slight loss of blood at the operation; or may be the result of a state of the system in which the physiological powers of the body are abnormally great, a condition in which both digestion and assimilation of the proteids are constantly maintained at a higher rate than is required to meet the normal expenditure.

This physiological excess results in a decided increase in the number of red blood-corpuscles, and in the quantity of the proteid elements of the blood, but with only a small increase in the quantity of the salts and water. If this condition keeps increasing, it will ultimately damage the system in various ways until it finally assumes a pathological significance.

Symptoms.—In polyæmia there is a full, turgid, and reddened face. In extreme cases or those of long duration there is often a slight purplish tint given to the color of the face and gums. This is probably due to the red-corpuscular bulk being greater than the capacity of the respiratory oxygenating area. The conjunctivæ are redder than normal, and the expression of the eyes is spoken of as being sharp and "*ferrety*." The pulse is full and strong. The temperature of the skin is above normal and fully maintained in the parts most remote from the heart. Headache and drowsiness are frequently experienced. Cases of this class have an unusually good appetite; their digestion is perfect and their assimilation above normal; their secretory and excretory powers are also better than we commonly find them.

Owing to this unusually large quantity of blood and its progressive accumulation, there finally comes a time when nature is unable completely to oxidize all the nutritive elements which are taken into the system. Hence upon exertion these subjects are apt to suffer from dyspnoea, the so-called "shortness of breath." The heart's action is labored, and not infrequently there is an associated hypertrophy of the left ventricle. This ventricular hypertrophy is usually produced as the result of the increased work called for on the part of the heart, to force along this abnormally large volume of highly-nutritive blood.

When the period of incomplete oxidation of the blood is reached,

there is often an unusually marked venous appearance of the contents of the surface blood-vessels.

In this class of subjects there is a very common tendency to develop the so-called "bilious attacks," which from a physiological standpoint may be regarded as a condition of progressive overwork on the part of the digestive and hepatic functions until they are no longer able to cope with the work imposed upon them, and a temporary suspension of action is induced. The physiological powers resist this imposition, as indicated by the symptoms that are developed,—loss of appetite, frequently associated with a naso-pharyngeal catarrh (commonly spoken of as "a cold in the head"), headache, and usually a mild form of jaundice.

The individual refuses food or takes an active purge, either of which temporarily arrests the nutritive supply, and the system is empowered to recover from its previous damage. It may, however, be several days before the appetite and digestion are actively restored, and during this time nature is enabled to work off the results of this excessive assimilation, and thus the plethoric condition is kept within what might be called physiological bounds.

Plethoric subjects are best divided into two classes, one of which has been designated the physiological or "sthenic" and the other the pathological or "asthenic" type; or, first, those in which we have a supra-nutritive condition without any vital impairment of the visceral organs, and, second, those in which as a result of this continued nutritive activity the visceral organs have been so long overworked that their protoplasmic vitality has become impaired.

When an inflammation or any acute disease attacks the former class, it will assume what clinically is commonly described as the sthenic type of inflammation or disease; but when developed in the second class, although it may commence as a sthenic form, it quickly degenerates into the asthenic type and often proves rapidly fatal.

The former will bear general bloodletting, but to bleed the latter would in itself result in almost certain death. In this connection it may be stated that Dr. Watson mentions one case in which seventy ounces of blood were withdrawn from the venous system before the sensation of faintness was induced. Consequently, from a therapeutic standpoint it is very essential that we should diagnosticate accurately which of these two forms of plethora exists before we decide upon the therapeutic methods to be employed.

Consequences.—The results of a general polyæmia are such as would follow from an over-distention of the blood-vessels with a highly-

nutritive fluid. The brain is often one of the first organs to suffer, probably because, first, it is incased in a bony box and has little or no chance to expand in order to compensate for the increased vascular distention; second, the brain is composed of soft and non-resisting elements; and, third, the perivascular spaces of the brain are unusually large,—about three times as great as the diameter of the vessels. This last peculiarity in a measure protects the cerebral tissue from the undue blood-pressure, but, on the other hand, it is a very potent factor in causing a rupture of the small vessels or capillaries. This form of hemorrhage is commonly spoken of as parenchymatous in character; histologically, however, its source is from the divided ends of the capillary vessels. It still remains a doubtful question whether this rupture and parenchymatous hemorrhage can occur so long as the normal nutritive integrity of the vessels is maintained. Probably not, but one of three things is more likely to be developed before the vessels give way,—either there has been a previously-induced impairment in the integrity of the vascular walls by a syphilitic infection, degenerative changes from an excessive use of alcoholic stimulants, or a loss of vital elasticity through the asthenic form of plethora just described.

This lesion of the blood-vessels may be local or universal. When general all the blood-vessels expand to accommodate the increasing bulk of blood, but if localized an early hemorrhage may be expected.

The lungs also suffer, and, as a result of the pulmonary engorgement, right ventricular hypertrophy is frequently developed.

The liver is another organ affected, but, owing to its position and physiological construction, it will bear this vascular distention better than any other organ in the body. In fact, it is a normal condition to have an increase and decrease in the volume of the liver from changes in the bulk of blood distributed to it. For this reason, in the liver we are not apt to have extravasations into the substance of the organ, but the volumetric capacity of its capillary system is very much increased and the gland as a whole becomes generally enlarged, so that it will hold from one-fourth to one-third more than the normal complement of blood. It is unquestionably largely aided in doing this by the very rapid and often enormous expansion of the spleen and its contained vascular system, which acts, as it were, similarly to a safety-valve for the portal circulation. This engorgement of the liver is especially marked if there is much hypertrophy of the right side of the heart. For with the pulmonary congestion, and the fact that the tricuspid valve is never thoroughly competent, the increased force of the hypertrophied right heart tends to crowd the blood back upon the liver, and

the hepatic engorgement is now the result both of an afflux to and an impeded efflux from the portal system resulting from this backward pressure from the heart. From this time on the functional activity of the liver becomes decidedly impaired, and the so-called asthenic type of plethora is induced, even if it had not already been developed. In fact, this disturbance of the hepatic circulation, together with the continuously increased work required of the system, is unquestionably the physiological explanation for the deteriorating effects of a prolonged polyæmia.

So long as the polyæmic condition remains of the sthenic or physiological type, the only changes found in the renal organs will be a hyperæmic condition of their vascular system, together with a slight hypertrophic condition of the epithelial cells lining the uriniferous tubules, to meet the increased excretory work imposed upon them by the plethoric state. But when the polyæmia assumes the asthenic or pathological form, and the functions of the liver are imperfectly effected, and the excretory products to be eliminated by the kidneys are incompletely formed as well as excessive in quantity, changes of a decidedly pathological nature will be speedily developed in the renal and other visceral organs. As a result, one of two pathological conditions will be developed in the kidneys.

1. A continuance of the hyperæmic state, followed by active metamorphic or degenerative changes in the epithelial-cell elements lining the uriniferous tubules of the kidneys, gives rise to what is known in medical pathology as an acute or chronic parenchymatous metamorphosis of the renal organs. This is called a metamorphic process rather than an inflammatory or degenerative condition, because of the physiological method of its development, which is that of gradually increased work with a gradually decreased nutritive supply, until the protoplasmic vitality is impaired and incomplete products of tissue-waste take the place of the normal and vital protoplasmic tissue of the epithelial cells, and we find as a result that the complete and normal products of tissue-waste are replaced in the urine by incomplete and abnormal excrementitious substances.

2. This prolonged hyperæmic condition of the renal circulation may result in the development of new connective-tissue elements between the uriniferous tubules, which together with the changes already described as occurring in the epithelial cells constitutes the condition commonly known as a chronic diffuse nephritis, or a chronic diffuse nephritis without exudation.

But, as any one can easily see from this description, these changes

have all been developed simply by a modification of the common physiological laws, and exclusive of the intervention of any inflammatory process, as inflammation is generally understood and described. Of course, if the term "inflammation" is going to be applied to all kinds of pathological problems irrespective of the physiological laws governing them, well and good, but it certainly seems more scientific to limit the term to those conditions which are clearly covered by its well-defined limitations, and seek for the explanation of those changes not clearly covered by the inflammatory pathology in a closer study of the modified physiological phenomena.

In the simple hypertrophic condition of the kidneys the only perceptible change in the urine will be a slight increase in the normal constituents of that fluid, giving it a higher color, stronger acidity, and a greater density. In the second group of cases there will be changes in the urine varying in proportion to the degree of the metamorphic transformation in the epithelial cells lining the uriniferous tubules. If the integrity of the cells is but slightly damaged, the only noticeable change in the urine will be a higher color, a very strong acidity, and a relative diminution in the urea, with a corresponding or greater increase in the urates, uric acid, and oxalates, so that the specific gravity often rises to 1.030 or 1.040. If the retrograde changes in the epithelial cells have advanced further, then these cells will excrete or desquamate, and, in addition to the above-enumerated products, the urine will be found to contain also both albumen and casts. The quantity of albumen¹ and casts discharged is always in direct proportion to the amount of metamorphic change in the epithelial-cell protoplasm.

These changes in the urine, if carefully studied and noted in each case, will enable the examiner to diagnose the form of plethora existing and make known the nutritive status of the patient. In cases requiring surgical interference the exact physiological nutritive vitality of the patient to be operated upon or treated is also accurately determined and understood. The physiological class will bear surgical operations and etherization and respond well to treatment, but the pathological class bear surgical interference poorly and respond slowly to the very best directed therapy. They are apt quickly to develop a more active and often fatal renal lesion by the combined effect upon the system of the natural fear of the surgeon's knife, the etherization, the necessary shock of every operation, and the increased reparative work necessitated by the existing or produced surgical condition.

¹ See Post-Graduate Medical Journal, p. 18, January, 1891.

Many surgical injuries have terminated fatally within a few hours or days after an operation, as the result of this active renal lesion excited by the above-enumerated causes, until it has now become recognized as one of the dangers attendant upon the administration of ether as an anæsthetic and of surgical operations in general.

Although ether *per se* is not a poisonous medicinal agent to the system, its administration as an anæsthetic is by no means so harmless as it was at one time thought to be. Anything which brings about results as ether does, by depriving the body of its requisite supply of oxygen, must produce more or less damage, by disturbing the chemico-physiological oxidation within the system. Ether further tends to decompose the hæmoglobin and destroy the red blood-corpuscles, exciting, as it were, a temporary hæmoglobinuria which still more decreases the oxygenating powers of the body. These two conditions or results which are attributable to the ether, together with the disturbance of the nervous mechanism of the system, often prove most serious in connection with all forms of surgical work of any magnitude, especially if the ether has been freely administered and its inhalation continued for a prolonged period; until now the surgical rule may be stated as follows: "the maximum of anæsthesia, with the minimum of ether, continued for the shortest possible space of time," if the best results are to be obtained.

With the general vascular engorgement and the intensified hepatic congestion, already described, small vascular tumors frequently develop at the ano-cutaneous margin or just within the rectum, giving rise to the various conditions known under the common name of piles or hemorrhoids. Hemorrhage from the alimentary tract may also be observed. Epistaxis is of frequent occurrence and at times quite profuse in character. A copious flow from the uterus at the menstrual epoch is quite common in plethoric women.

Polyæmia may produce a varicose condition of the veins, as is seen in athletes and in the well-to-do but hard-laboring classes. It, however, is somewhat doubtful whether the physiological, active, or non-devitalizing plethora, in the absence of any impairment in the nutrition of the walls of the veins or arteries, ever causes a varicosity of the veins or an aneurismal dilatation of the arteries. In the two classes cited the forced work with the forced feeding overtaxes the chemico-physiological and vitalizing powers of the system, tends to change a physiological into a pathological polyæmia, and easily accounts for degenerative changes in the vascular walls which will admit of their dilatation under severe strain. It also explains the general degenera-

tive changes throughout the system and the low longevity in athletes as a class. It shows clearly where the danger lies in connection with forced feeding and over-exercise. If there is a previous abnormality in the walls of the vessels, or the plethora becomes of the devitalizing or pathological type, the above-described vascular conditions might easily be attributed to the abnormally large volume of blood, but that alone is not sufficient to cause varicose veins and aneurisms.

By some it has been claimed that general polyæmia especially predisposes to inflammatory conditions. There is, however, no well-founded ground for this assertion, certainly not in the sthenic type, even if it is admissible in the asthenic class of cases. But there is no doubt that, when an inflammatory process has once been excited in a plethoric subject, there is a strong tendency for the disease to run a severe and active course, one which will require a more vigorous and rigid course of treatment than would be necessary where the nutritive powers are at or even below their normal standard. If the physiological functions are not up to or are considerably below the normal, the opposite or stimulating plan of treatment is necessitated.

From time to time localized spots of what appear to be plethoric zones occur, but in this condition there is not so much a change in the quality as in the quantity of blood distributed to the part in a given time. This increase in quantity, so far as the local nutrition is concerned, is equivalent to an increase in quality as well as quantity. It is this peculiar law of localized determination of blood to the part that the physician and surgeon call into play in the treatment of inflammation and pathological processes in general.

It is now pretty generally recognized that all nutritive activity is effected from the arterial side of the capillary circulation, or from what are known as arterial capillaries. After the blood has passed this point in the vascular system its nutritive function is reduced to the minimum or totally abolished. This being a common physiological law, if we can force a large quantity of nutritive blood into the arterial capillaries and hold it there for a time, we increase nutritive activity. If this condition is brought to bear repeatedly or continuously upon a non-inflammatory territory or organ, we have a development of new tissue, often called a chronic inflammatory process, a formative or productive inflammation, or inflammation without the formation of fibrin, serum, or pus; physiologically, however, this lesion is a true hypertrophy brought about by a large number of conditions. The gin-drinker's liver is perhaps one of the most typical examples of this class of formation. The repeated dilatations and flushing of the hepatic circulation

with blood by the repeated dram finally causes a large production of new connective tissue between the hepatic lobules, and certainly without inflammatory action.

If we excite this phenomenon for a short time in an inflamed zone and in the presence of the inflammatory exudation, a rapid fatty degeneration of the inflammatory formation is induced. These emulsified products are easily taken up by the lymphatics, converted by the system into excrementitious substances, and finally eliminated by the excretory organs. With early and recent inflammatory exudations this is quickly accomplished, as illustrated in the rapid and perfect resolution in pneumonia. In inflammations of longer duration, and less favorably situated, or where partial organization has occurred, this resolution and restoration to the normal standard cannot be so readily or perfectly accomplished. We can, however, by the judicious selection of medicinal agents, so assist nature that it can more completely effect this change than is commonly taught.

The fully-developed tissue-formations which result from a truly inflammatory process cannot in all cases be completely removed, neither can the newly-developed tissue which has been produced by the increased nutritive supply be entirely dissipated, but in either case its further development can be arrested.

In connection with the glandular organs the formation of interstitial tissue can be stopped, and, if the epithelial elements have not been too seriously impaired, or too large a quantity or too thick a layer of this new tissue been deposited between the blood-vessels and the epithelial cells, the gland may be, and often is, completely restored, so far as its physiological secretory and excretory activity is concerned, but will always be abnormal from the histological observer's side of the question. Therefore, if we view such cases purely from the pathological stand-point, recovery under these circumstances is absolutely impossible; but, if viewed more broadly and from a chemico-physiological and clinical aspect, and if they are treated as indicated by it, recovery is not only possible, but almost a certainty, clinically and physiologically speaking. This difference between the purely histological or pathological condition and the physiological and clinical has been too often neglected, until many diseases have been classed as incurable because the original histological condition cannot be restored. As a result, we find teachers of good repute giving out the impression that many cases are incurable, while to all intent and purpose they are cured and placed in such a condition that the individual may attain a good old age, with visceral organs which have been for years in a

badly-damaged histological condition, yet able to perform their physiological functions sufficiently well to give an unusually fair degree of health to their owner.

Treatment.—In considering the course of treatment to be outlined in the management of every inflammatory condition, medical or surgical, it is absolutely essential to differentiate accurately between these two kinds of plethora, the normal and the subnormal or anæmic state.

That class of cases in which the vital functions have not been impaired by the plethoric condition will in many instances admit of, and often be decidedly benefited by, the old and heroic treatment known as phlebotomy and arteriotomy. It may in some individuals be carried to its maximum limit with advantage. Dr. Watson, as I have stated, mentions one instance where seventy ounces were withdrawn from a vein before the sensation of faintness was induced, but moderately employed it will usually give the most satisfactory results.

In the class of polyæmic cases in which the vital functions have become impaired general bloodletting would in all probability rapidly hasten the fatal end. In this class of subjects physiological general bloodletting, or internal bleeding, as it is sometimes called, by the free use of aconite or drugs of similar action, will produce the same amount of general vascular depletion, and cause a fall in blood-pressure as a whole. By this method the blood which will be so greatly needed later on, to sustain the weakened system and repair the damage produced by the inflammatory process or disease, will be retained within the circulatory channel, where it can be reached and utilized. I have seen cases in which free bloodletting has been followed by the most satisfactory results, but when this general abstraction of blood is considered too heroic the physiological method is always in order.

It may be well to state that either plan of treatment is of service only during the first stage of the inflammation, or that of engorgement, or within the first twelve or twenty-four hours; for in every typical and well-regulated inflammatory process the stage of progressive engorgement has reached its height at the end of twelve or twenty-four hours, and from this time on a uniform and well-sustained circulation through the inflamed zone is more favorable to resolution and repair than a weak or impeded blood-current.

General and local depleting agents are often useful, and should be employed with the hope of affecting the circulation in a manner similar to bleeding. Hydragogue cathartics, for instance, cause a rapid abstraction of water from the system, and in that way diminish the

total volumetric bulk of blood, and lower general tension, with a similar result to that already described.

Venesection or the use of aconite, especially the latter when used early in the congestive stage of the inflammatory process, will diminish both the force and frequency of the heart's action; the arterioles will dilate, the general blood-tension will be lowered, and an increased volume of blood will be carried over into the venous side of the circulatory apparatus. This physiological phenomenon rapidly depletes the general arterial system, lowers its tension, reduces nutritive activity, and decreases to the minimum its power to produce a local determination or inflammatory engorgement. In this way the localized strain upon the capillaries in the inflamed zone is rendered as small as possible and the amount of inflammatory exudation very much decreased. By taking advantage of these laws and using the drugs which will modify them, we decidedly shorten the duration and intensity of the first and second stages of every inflammatory process, decrease the amount of local damage, and reduce the quantity of the inflammatory exudation which is to be liquefied and removed by a process of fatty degeneration, emulsification, and absorption by the lymphatics, thus aiding nature very decidedly in shortening the total duration of the inflammation and enabling her more rapidly to effect a complete return to the normal condition.

ANGINA LUDOVICI IN ITS RELATION TO DIPHTHERIA.

A CLINICAL LECTURE.

BY JAMES FINLAYSON, M.D.,

Physician to the Glasgow Western Infirmary, and to the Royal Hospital for Sick Children, Glasgow.

"ANGINA LUDOVICI," or "Ludwig's angina," is not, as yet, a widely-known name in this country, and some difficulty is experienced, at times, in ascertaining clearly what is intended by the term. An admirable account of it, from the historical point of view, was given by Mr. R. W. Parker in the *Lancet* for October, 1879 (vol. ii. pp. 572-609). He there gives a summary of the original paper by Dr. Ludwig, of Stuttgart (1836), and brings together many statements by various authors, ancient and modern. In these "Remarks on Cellulitis of the Neck (Angina Ludovici)," he likewise makes a valuable contribution to its clinical history. In his summary he recognizes three varieties of cellulitis of the neck,—(1) idiopathic (angina Ludovici); (2) traumatic; (3) by extension.

But in calling this, or any form of disease, "idiopathic," we are using a merely provisional term to cover our ignorance, and so we are always on the outlook for explanations of "idiopathic" disorders.

That "angina Ludovici" has been recognized as having some relationship with diphtheria might almost be inferred from one of its synonymes,—“diphtheria of the cellular tissue.” According to all authorities, however, it seems to be rare to find deep-seated suppuration in the neck as a complication of pronounced faucial diphtheria; a marked contrast to the frequency with which cellulitis occurs in scarlatina “by extension,” as Mr. Parker would say, from the lymphatic glands.

About a year ago I had the chance of seeing such a case in the family of a medical friend. I was asked to see a girl, about eight years old, who had been ill for some ten days with undoubted diphtheria. Although the throat was somewhat better, there were still distinct

patches visible ; she had albuminuria, and subsequently regurgitation of fluids through the nose and a nasal twang in the voice. Another member of the family had a sharp attack of diphtheria at the same time. In the case of this girl I found a very marked swelling, with tenderness on the left side of the neck. There was also considerable diffused hardness in its neighborhood which at once reminded me of the condition I had met with, shortly before, in a nurse's case to be mentioned immediately. It was clear to me that this was not due to the ordinary glandular swelling in the neck so commonly observed in diphtheria, and it seemed to me to point to the presence of a diffuse cellulitis or abscess. Accordingly, I suggested that Dr. Hector C. Cameron should see the case, and he agreed that there was already incipient suppuration deep in the neck. In the course of two or three days he opened it, and the girl made a good recovery. At the consultation he stated that he had never before been asked to open such an abscess in the neck in the case of diphtheria.

The nurse just alluded to presented a series of symptoms even more instructive, inasmuch as the diphtheritic nature of her illness might easily have been overlooked ; in point of fact, by the time the nurse would naturally have come under special notice, if she had not been resident in a hospital, the swelling in the neck and the deep-seated abscess would very likely have been regarded as purely idiopathic, for by that time the throat had recovered. A consideration of the following facts, however, seems to me to place the diphtheritic nature of this case beyond question.

Nurse Elsi, aged twenty-four, was admitted to a side room under my care on December 14, 1888.

She had come as a nurse to the Glasgow Western Infirmary on November 20, and soon thereafter was brought in contact with a case of tracheotomy. This operation was performed, as a matter of urgency, in a medical ward ; the patient there was a child who had been sent in under Dr. Gairdner's care. The medical attendant of the child at home had seen white patches in the throat, and he was quite clearly of opinion that it was a case of diphtheria. By the time, however, that the child was admitted to the Infirmary, no patches were visible, and when tracheotomy was performed, on November 28, no membrane was seen in the fauces, or anywhere, at the operation. The child improved for a time, but died on December 8, from increasing difficulty in breathing, which evidently did not depend on obstruction at or near the tube. No post-mortem examination of this case could be obtained.

The nurse was in close contact with the child from November 28

till the death, on December 8, and was, thereafter, on duty in the same ward. She began to feel ill and shivery on December 10, and was seen by the superintendent, Dr. A. W. Russell, next day. He found the throat to have a dusky-red appearance, with a painful spot on the right side externally, very tender to the touch. Next day he saw a small white speck on the right tonsil, and there was a painful swelling on the right side of the neck, but only on the right side. The following day she was thought to be better; but as this improvement did not continue, I was asked to see her with the superintendent on December 14. There was then a perfectly plain white patch, low down on the right tonsil, with a very marked, painful, and tender swelling on the right side of the neck. In view of this condition and the history of the fatal case, I at once advised her removal from the Nurses' Home to a large side room reserved for herself, and her mixture of chlorate of potash and hydrochloric acid was continued.

She felt very ill during the night of her removal; her temperature reached 102.8° F. Next day, however, she felt her throat better; and, much to my surprise, the white patch, instead of being larger, as I feared, could not be recognized, and no patches were subsequently seen, although the right tonsil remained obviously enlarged. She preferred cotton-wool applications to poultices, having had a trial of both on her neck. The swelling of the neck was by the 15th and 16th of December much greater, the hardness more diffused, and the redness increased. The hard swelling below the right ear, measured roughly, seemed to be about three inches in its various diameters. Its great tenderness had somewhat lessened. There had been no red rash on the skin, and she was supposed to have had scarlatina in childhood. The urine contained no albumin. She was able to take fluid food very well.

She was watched by my surgical colleague, Dr. Patterson, from December 17; he could not then detect suppuration, and advised the free use of tincture of steel.

On December 23 the patient was noted to be better in her general condition: the temperature had gradually become lower and was then about 100° F. for its highest reading. The hard swelling was distinctly reduced in area, but one spot in it seemed softening. No rigors had occurred; the urine was still free from albumin. On December 27 the abscess was opened by Dr. Patterson, under chloroform, in the lower part of the right side of the neck. A considerable quantity of bloody pus was squeezed out, and a decalcified drainage-tube was inserted. It went in towards the submaxillary region to the extent of about three inches.

The temperature went down quite to the normal level after the operation. No accidents occurred subsequently, and she was able to go home to the north of Scotland on January 22, and reported herself subsequently as keeping well.

In this case the diffused swelling in the neck, with its subsequent suppuration, extending towards the submaxillary region, had a clear connection with faucial diphtheria. The tender spot, externally coinciding with the site of the subsequent abscess, was a notable feature in her case from the very beginning of her illness. The remarkable way in which the white patch on the tonsil disappeared in the nurse's case, although the illness became more severe, bore considerable similarity to the behavior of the patch in the throat of the child from whom she evidently contracted the infection. This rapid disappearance tended to obscure the diagnosis of diphtheria in both cases.

Two other cases have likewise come under my notice suggesting a similar relationship, although not so definitely. In one case a gentleman affected with sore throat became in two or three days suddenly alarmingly ill from laryngeal obstruction, probably due to œdema of the glottis, rapidly developed during a long drive towards home in a closed carriage; the danger was so great as to demand a hurried tracheotomy. This relieved him; but further obstruction occurred lower down; this was again relieved, on the advice of an eminent surgeon, by an extension of the incision and the use of a longer tube. Further difficulty supervened, and was, so far, explained and relieved by the expulsion of pus from the tube and the wound. This improvement only lasted a short time, and death occurred after about ten or twelve days' illness. The urine was highly albuminous early in the case. I believe no patches were seen in the throat, and by the time I saw him, the day after the tracheotomy, there was only redness there, with some œdema, especially about the uvula. The medical man who saw the case at the beginning was afraid of diphtheria declaring itself, and the albuminuria, detected at my visit, pointed to some grave constitutional poisoning.

The remaining case I have to mention was that of a medical friend in a watering-place in Scotland, where, shortly after his illness, a somewhat alarming outbreak of diphtheria occurred. His wife was first affected with a sore throat, to which, indeed, she was subject; but this attack seemed different from the other suppurations she had had, and in any case was more severe. As a little stinking pus, however, came away just before she began to mend, the case was regarded as a quinsy. In a fortnight after her recovery her husband's throat became sore,

red, and swollen ; next day the angle of the jaw was hard and swollen, and on the fourth day a red blush appeared on the side of the neck. In a short time alarming symptoms of cellulitis in the neck were developed, and Dr. Hector C. Cameron had to open a deep-seated abscess, after which rapid recovery took place. I did not see my friend in this illness, although the details were reported to me. Subsequently, the presence of an epidemic, chiefly of diphtheria (traceable apparently to some obstruction of the main drains not far from his house), was only too obvious ; some two cases of diphtheria had appeared in the town previously. Along with diphtheria cases of erysipelas also appeared, and one fatal case in a baby was ascribed to pyæmia.

The first of my cases here narrated points conclusively to the occasional dependence of angina Ludovici on the poison of diphtheria. The second case, in view of the whole history, likewise presents proof of a very conclusive nature, although we can see how very easily such proof might have been missed. The third case is very suggestive of a similar connection, although the evidence is by no means strong. The fourth case had perhaps a more close connection with erysipelas than diphtheria ; some relationship between these two diseases is now generally admitted, and in the epidemic in the town, after my friend's illness, these two diseases both occurred. The relationship of erysipelas to angina Ludovici was recognized by Ludwig himself, and the cases now adduced point strongly to diphtheria also as an etiological factor.

SORE THROAT.

A CLINICAL LECTURE.

BY CHRISTOPHER HEATH, F.R.C.S.,

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University College, London.

GENTLEMEN,—In severe weather, such as we have been having lately, sore throats must be extremely common. I therefore take the opportunity of saying a few words to you upon the subject.

The commonest form of sore throat is acute catarrhal pharyngitis; that is to say, a person who has, perhaps, a delicate throat, being exposed to cold, finds that he has some little difficulty in swallowing and a little pain in the throat. On looking into such a throat as that, you will see that there is a general injection of the mucous membrane, and not much else. It is a simple matter, which will get well under ordinary treatment; by which I mean gargling with hot milk and water, applying a poultice round the neck, and perhaps taking a purge, if it is required. The only thing that I would say with regard to this simple matter is that you should be careful with regard to the question of the possibility of its being an infectious sore throat. I mean it may possibly be the beginning of scarlet fever or of diphtheria. I need hardly point out how essential it is that you as practitioners in families should take every precaution to avoid any possibility of error, and to isolate immediately any child whom you suspect even to be sickening of either of those diseases.

Then next in frequency to this simple pharyngitis I would put acute tonsillitis, or quinsy. You find that the patient, more often a female than a male, and a young person, usually, of delicate habit, has been exposed to cold and finds difficulty in swallowing and in speaking. The thickness of the voice is very characteristic, and when you have once heard it you will recognize it directly. That patient, you will say to yourself, has got inflammation about the tonsil, and now, on looking into the throat, you see at once that the tonsil is considerably enlarged, the fauces are injected, but the thing that immediately strikes you is

that the palate is pushed forward by the large tonsil behind it. Here let me remind you a little of the anatomy of the part,—viz., that the tonsil in health is situated between the anterior and posterior pillars of the fauces, and that ordinarily we see only a small portion of the tonsil projecting towards the middle line. Now, when the tonsil becomes inflamed, the whole of the organ becomes enlarged and forms a projection behind the soft palate, pushing forward the latter, which is somewhat red and discolored. You find in these cases that the patient has great difficulty in swallowing, and has a good deal of pain, often extending up the Eustachian tubes to the ears, and the consequence is that they endeavor to avoid swallowing as much as possible, even the saliva, which they hawk up with considerable difficulty, and that they find great difficulty in taking food. It is very important to bear this in mind, because these patients require food and nourishment, and unless you are careful to support them by properly-prepared liquid food, you may find them running down and getting into a very dangerous condition. Now, in the early stage of acute tonsillitis—if seen in time—I have great faith in the administration of an emetic,—I mean some warm mustard and water. It is very remarkable what an effect that has in producing revulsion and stopping the inflammatory action about the tonsil; but, unfortunately, one does not often see the patient early enough. The inflammation has got beyond the stage at which the emetic could stop it, and you have therefore to treat the disease as you find it. Now, in acute tonsillitis there can be no question about the propriety of warm applications,—hot applications inside and hot poultices outside. With regard to medicine, I believe the best you can give the patient to be belladonna in repeated doses, and I should give drop doses of the tincture of this drug every hour, and should also apply belladonna externally beneath the poultice, which gives great relief to the painful swelling. If, however, the inflammation does not subside within twenty-four hours, you may be quite sure that an abscess will form. I want to say a word particularly as to the place at which that abscess should be opened. No doubt patients have lost their lives before now from an abscess in quinsy suffocating them; and, again, there are plenty of cases on record where, at the last gasp, as it were, the abscess has burst and the patient has been immediately relieved and got well. But the surgeon can do a great deal to relieve by a judicious puncture at the proper place and in the proper manner; that is, to make your puncture with a guarded bistoury through the soft palate into the tonsil. Do not try to get round the anterior pillar of the fauces, because, if you do, you will have your knife in an oblique

direction, somewhat dangerous, perhaps, for the carotid artery ; but take my advice and go straight back through the soft palate, and I will undertake to say that no effort on your part can possibly bring the knife into any relation at all with the carotid vessels. Of course, it is difficult to be quite sure in all cases that matter has formed, and it may be that on making your puncture into the tonsil through the soft palate nothing but blood escapes. So much the better for the patient. The puncture will relieve the congestion ; it may possibly save the formation of an abscess ; or if it should happen that an abscess forms later, the matter will be able to find its way out perfectly easily through the puncture you have already made. But in a good many cases you will find the matter already there, if you will make the puncture, as I say, through the soft palate and by cutting a little upward open the upper part of the tonsil. So soon as the abscess is opened the patient is relieved. He can swallow, he can speak, he begins to take food well, and very soon will convalesce.

Now, the third kind of acute inflammation of the throat to which I will call your attention is the most dangerous of the three. It is acute œdema of the pharynx, which tends to spread down to the larynx, making it so dangerous to the life of the patient. You will find that a patient is ill, is hoarse, and when you look into the throat you see not very many signs of inflammation, but a general œdematous condition of the parts : the uvula is twice its proper size ; the pillars of the fauces are considerably swollen, and if you put your finger in, you will probably feel that the tissues about the epiglottis also are considerably swollen. The danger of these cases is that the œdema may so involve the upper part of and extend down into the larynx that the patient's breathing may become very much embarrassed, and, if not promptly relieved, may cause him to lose his life. When you are called in to a case of that kind there is very little difficulty in recognizing it, if the disease has already involved the air-passages, because the breathing of the patient is so very characteristic. The stridor, the noise which the patient makes in the drawing in and out of his breath, is so characteristic that you can very often recognize it, in fact, before you get into the room. Now, a case of that kind is of the most urgent description. You must remain with that patient until you have relieved him, and the best way to do this will be to make some punctures with a sharp bistoury into the œdematous tissues at the base of the tongue. The operation is not a very serious one. You protect the blade of your bistoury with a piece of lint, and, taking the point of the knife under your forefinger, pass it well back to the

epiglottis, puncture and incise in the neighborhood of the epiglottis and back of the tongue, so giving very great relief to the patient. Some little blood comes away and a good deal of serum, and then, by assiduous hot gargling, very probably the patient is immediately relieved. Now, of course, a case of this kind may at once be relieved and get well; but you must be prepared for a more serious proceeding if it should be necessary, and, as these cases generally get worse towards night, you should make a point of seeing them in the evening and be prepared if necessary to do laryngotomy. I say laryngotomy advisedly, rather than tracheotomy, for this reason: the oedema never extends below the vocal cords, and if you do laryngotomy, you are, of course, completely below the vocal cords, and give your patient efficient relief, and with very little risk. Tracheotomy is a more serious operation, and I know that a young surgeon about to do his first tracheotomy may very naturally feel somewhat nervous about it. He has possibly read of, and may have seen, certain accidents occurring during the performance of tracheotomy, and, therefore, approaches the operation with a possibly unnecessary amount of mental disturbance. Now, laryngotomy is such a simple proceeding that I do not think any surgeon *can* go wrong. All he has to do is to pass his finger from the sternum upward, and to mark the first projection which he meets with in the neck: that is the cricoid cartilage. If he make an opening into the windpipe immediately above the cricoid cartilage, he will do all that is necessary for his patient and will probably have no trouble in doing it, and, therefore, as well as for the reason I have already given,—that it is amply sufficient for all cases of oedema,—I strongly recommend you to do laryngotomy rather than tracheotomy. Tracheotomy, of course, is a perfectly justifiable proceeding, and if you have got assistance handy and all your necessary instruments, I should not object to your doing tracheotomy if for any reason you preferred it; but I am supposing a young surgeon who is away from all assistance, who has to act on his own authority, and I strongly recommend him to do laryngotomy rather than tracheotomy. When laryngotomy is done, of course, the ordinary laryngotomy-tube should be inserted; but if you have not got a laryngotomy-tube, a small tracheotomy-tube will answer every purpose; and even in the absence of all tubes it is quite possible to keep the wound sufficiently open with a pair of scissors, or even with a safety-pin. In that way you may keep open the wound until you have had time to procure the ordinary tube, and the probability is that at the end of forty-eight hours all oedema will have subsided, the tube can be removed, and the patient will get perfectly well.

These, then, are the three forms of acute sore throat to which I wished to direct your attention. Let me say, now, a few words with regard to the more chronic forms of sore throat; and first with regard to that form which we know so well in hospitals as "hospital sore throat." I mean when a resident in the hospital, being necessarily exposed to bad air and hospital influences, finds that his throat is sore, that he cannot swallow quite comfortably, that he has lost his appetite, and that he is feeling generally ill. When you look into a throat of that kind, you see a general congestion of the parts, which, of course, it is important should be relieved as soon as possible. Now, for that kind of sore throat, which you may meet with also in private houses as the result very often of some bad air from drains, I know of no better local application than sulphurous acid and glycerin, in equal parts, which, painted on a throat of that kind, will give immense relief. At the same time, the patient should be taken out of the evil influences from which he is suffering; should be sent into the fresh air, should have plenty of nourishing food and some wine, and he will very soon get well. Those are cases which recover most satisfactorily if the patient is put under proper hygienic conditions.

You may, however, have a patient come to you with sore throat which is due to a very different cause from that I have mentioned. A young man comes to you simply because his throat is sore, but when you look into it you see at once a very characteristic appearance on the tonsil, a gray excavated ulcer, which is always the result of secondary syphilis. Then, again, you may meet with this in a married woman, who has not the slightest suspicion that she has got disease from her husband, and I need hardly say how cautious you should be in giving the slightest hint which may lead to domestic unhappiness and be a breach of professional confidence. These cases of secondary syphilis, of course, are simply symptomatic of the syphilitic poison which is already in the patient's blood. It is no business of yours to find out very particularly how the poison got there; it is quite sufficient that you recognize a secondary syphilitic throat, and you proceed to treat it by treating the syphilis and also by treating the throat. The bichloride of mercury is, no doubt, the best remedy which can be given for secondary syphilis, and as regards the throat, you may brush it over with any stimulating application. Perhaps a mercurial gargle is one of the best applications, a bichloride of mercury gargle, say one of a quarter of a grain to the ounce, with a little honey, and you let the patient gargle his throat two or three times a day with that until the ulceration is healed. But then, again, there is another form of sore

throat which you may see both in adults and occasionally in children. I mean where you have tertiary or congenital syphilis affecting the palate and pharynx. Now, whenever you see ulceration of the back of the pharynx, always suspect that it is of syphilitic origin. In the great majority of cases you will be right. Patients who have no other symptoms whatever of syphilis have this tertiary ulceration of a peculiar serpiginous character, affecting the palate and pharynx, and children who have inherited congenital syphilis from their parents have the same kind of affection. Those are all cases which can be very well treated by iodide of potassium internally and by local insufflation of iodoform, or, perhaps better, iodol combined with borax. The formula I generally use is one part of iodol to seven of borax, and I find that this blown into the throat is an extremely useful and satisfactory application.

Then, you will have before you from time to time cases of chronic tonsillitis, mostly occurring in children and young people. The appearance of a child who has enlarged tonsils is very characteristic, because he cannot breathe through his nose. He sits with his mouth open, which gives a peculiar and very characteristic heavy or stupid appearance to the face. Then, again, you will find that in many of these cases there is a certain amount of deafness, due to the involvement of the Eustachian tube, and many of these unfortunate children are thought to be very stupid when they really are a little deaf. I warn you, therefore, that you should take care to protect these deaf children from being treated as inattentive, when really the fact is they are not able to hear. When you look into the throat and see the large tonsil, there cannot be a doubt about the nature of the case. The tonsil is two or three times its proper size, and meets its fellow in the middle line. Not merely is the tonsil enlarged, but you will notice probably that there is a good deal of chronic affection of the whole of the mucous membrane of the pharynx and naso-pharynx; there are, in fact, adenoid vegetations which extend up into the posterior nares. Now, a tonsil, of course, can be treated by various local applications, but, after all, the best plan, I believe, is, in case of the chronic enlargement, to remove a portion of the gland. By far the simplest method is to use the ordinary guillotine, by no means a new instrument, which takes off a considerable portion of the tonsil but does not aim at removing the whole. Having got rid of the tonsil, you will then proceed to treat the adenoid vegetations, which can be scraped away most satisfactorily with the finger if you gag your patient (and it is hardly safe to deal with a child without gagging it); then slip your finger behind the soft

palate and up into the pharynx, where you will come to a great mass of soft tissue filling up the posterior nares. With the nail you can scrape those away very satisfactorily, and more so, I think, than with any instrument. Having scraped them away, the patient will then be able to blow the nose, and you can follow up the treatment afterwards by introducing a bent brush into the naso-pharynx behind the soft palate and applying to it glycerin of carbolio acid. That applied thoroughly to the naso-pharynx produces extremely good effects, and the painfulness of the application can be completely got over by using a little cocaine with it. The cases of chronic tonsillitis and adenoid disease occur in children of the strumous type, and you therefore must also treat the so-called struma. Many of them, no doubt, are instances of congenital syphilis, slight it may be, but still there is the syphilitic taint, and it would be well to bear that in mind, and to examine the condition of the teeth and to see whether there are any evidences in the central incisors of the notches, producing what are known as Hutchinson's teeth. In these cases cod-liver oil is extremely useful; the syrup of the iodide of iron is perhaps still better, or any of the ordinary tonics used in childhood may be employed. But, after all, the great thing is get those children out into the fresh air as much as practicable, and if possible to send them to the sea-side.

Then we come lastly to a form of sore throat which has got a name given to it on account of the class of persons in whom it most commonly occurs, I mean *dysphonia clericorum*, the sore throat of the clergy. You will find that you are frequently consulted by young clerics because they suffer from constant hoarseness and sore throat. Now, one reason why they suffer in that way is because they have to use their voices, and they have never been properly taught how to speak. If the clergy would learn to use their lips and always to speak out to the man at the end of the church, the intervening members of the congregation would have no difficulty in hearing what they say. But if they will speak, as some of them do, in their throats instead of enunciating their words with their lips, of course they are not heard well, and there is a tendency to produce, from the strain upon the throat, a congested condition of that part. It is a curious thing that you are hardly ever consulted by elderly married clergymen for affections of this kind. It is in the young and unmarried that *dysphonia clericorum* occurs, and, for my own part, I must confess that I think it is a good deal a nervous disease, and that it is connected in some way with the sexual organs. When a man gets married he forgets about his voice and settles down to his clerical duties, and has no

great difficulty ; but it is the young and unmarried curate, who is no doubt often placed under circumstances of considerable trial, who finds that his voice is breaking down and that he is, consequently, obliged to throw up work and to seek medical advice. I am not at all an advocate of early marriages for the clergy, but still I am quite sure that a good many of these sore throats are cured, so to speak, by matrimony. When they come to you for advice, the first thing I should strongly urge you to do is to advise the clergyman to use his lips. If he will use his lips, as I said before, he will save his voice ; and then, in addition to that, you may very well give him a spray to use. Before he goes on duty, before he goes into the pulpit, he should spray his throat ; and, perhaps, one of the simplest and best sprays is a spray of sulphate of zinc, two grains to the ounce, which is perfectly harmless, and which I have known to be extremely useful. Then, again, he may do good by sucking a lozenge occasionally. Perhaps one of the best is a tablet made of one grain of chlorate of soda and three grains of borax. This is made into a tablet and can be sucked slowly, and certainly gives the patient relief. In that way the case is to be met, and also by giving a tonic where it is required ; but, as I said before, it is a troublesome complaint of young men which tends to wear itself out.

THE TREATMENT OF COUGH IN PHTHISIS.

A CLINICAL LECTURE.

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GENTLEMEN,—In opening the present course of post-graduate instruction at the Hospital for Consumption with a lecture on the treatment of cough, I feel that I owe you an apology. Coming here as you do at this time with your minds full of the wonderful method of treatment for tuberculosis introduced by Professor Koch, you naturally expect to hear something of it from me, not my views on the treatment of but one of the symptoms of consumption. In the first place, however, while you will have an opportunity of seeing our Koch cases for yourselves in the wards, it is premature to offer an opinion of the progress they may have made. In the second place, whatever may be the result of this or of any other rational system of treatment of pulmonary tuberculosis, the symptomatic treatment of the disease remains, and must long remain, a subject of grave concern to the practitioner. While the pathology and the causal treatment of phthisis are being settled, our patients are calling aloud for help from us. Of the many symptoms of this disease, cough is one of the most distressing and dangerous. It breaks the sleep, it causes pain, it leads to hæmoptysis and pneumothorax, it ends in vomiting which robs the patient of his precarious nourishment, and it increases in other obvious ways the debility or exhaustion. Or, to pass for a moment to the other extreme, it may become feeble, ineffective, and finally cease from very weakness,—a condition of more evil omen to the practised observer than is the other. Of these two aspects of cough, the severe or excessive and the feeble or absent cough, I shall have time to-day to touch only on the former, to which I shall now direct your attention without further preface.

In what order is the excessive, exhausting cough of phthisis to be

most profitably discussed? The severity of this symptom is determined by a variety of circumstances, particularly the subject or individual affected, the stage of the consumption, the situation of the cavity, and the condition of the other organs, for instance, the digestive tract. From a strictly scientific point of view it would no doubt be more correct—at any rate, in a course of systematic lectures—to adopt these causes as the divisions of our subject. But a more useful arrangement, from a clinical or practical point of view, of cases of severe cough in phthisis is according to *the time of its occurrence*, and this division I propose to adopt on the present occasion.

Thus regarded, the principal clinical types of the urgent symptom we are considering are as follow :

(1) Cough in the evening; (2) cough at bedtime; (3) cough during the night; (4) cough on waking, stirring, rising, and dressing in the morning; (5) cough after meals; and (6) excessive cough at any time, with or without abundant expectoration. I have adopted this order of discussion because the management of cough naturally begins with the preparation of our patient for the night that is before him. I shall take, for the purpose of illustrating the methods which I recommend, an ordinary case of active phthisis in a young adult; and the term “management,” which I have just employed, will indicate to you the character of much that I shall have to tell you,—of measures that are mainly *non-medicinal*, many purely preventive, and all essentially of the nature of general management of the patient.

1. *Cough in the Evening*.—It is scarcely necessary that I should sketch to you the condition and surroundings of the phthisical patient whom we have to treat for evening cough. We find him, as a rule, sitting with the other members of the family who have finished the work of the day. If it be winter, he is in an overheated room, filled with the products of respiration and burning gas,—possibly with tobacco-smoke; talking, laughing, bearing up against an increasing sense of weariness for the sake of his friends or in the presence of visitors, or to snatch a little social enjoyment after the dullness of an invalid's day. There are three common results of this unwholesome arrangement,—first, exhaustion; second, a rise of temperature; and, third, cough. Count the pulse, look at the countenance, mark the expression and posture of weariness, observe the cough, and take the temperature, and you will find that matters are as I have described them to you.

All these effects must be prevented, for they indicate bodily exhaustion. But there is another reason why they have to be forestalled: the patient is preparing for the night,—the working part of the day,

if I may so express it, for a case of active phthisis. Do not let us *begin* the night with fatigue, high fever, and cough. Our proper line of treatment is obvious,—the patient *must retire early to bed*. The best rule is to send him to bed at eight (or it may be nine) o'clock, to the minute; and as much earlier as may be necessary, if he feel weary. The patient may protest against this order. "I cannot sleep," he will say; "let me sit up." You must be firm. You will find that such patient is inverting day and night: retiring late, lying awake with cough until the early morning, and sleeping into the forenoon,—it may be to mid-day. All this is wrong and must be changed, and the only hope of success lies in *beginning the night early*. If this course be pursued, the evening cough will be in great measure prevented. No medicine will be required for it. The patient is rescued from the unhealthy atmosphere and excitement, and sent betimes to the cool, quiet atmosphere of his bedroom. The cause of the cough is removed; the symptom disappears.

2. *Cough at Bedtime*.—Very few patients suffering from consumption escape cough at bedtime, and with some it is their chief complaint. It is of itself severe, harassing, and exhausting; and, what is of far more importance, it prevents sleep,—"*starting off*," as we are told, "*a bout of coughing which may last for hours*." The origin of this distressing symptom is obvious: it is induced by the hurried movement, exertion, change of temperature, and change of posture which the poor breathless and feverish patient has to encounter in the process of retiring up-stairs, undressing, lying down, and getting or trying to get to sleep. When thus regarded, the cough of bedtime can be treated with some hope of success.

In the first place, the patient must be instructed to retire to his room *slowly*. There is to be no hurrying up-stairs; a bad case must be carried. He finds his room faithfully prepared for him, sweet and fresh from thorough ventilation since he left it in the morning, warm and comfortable with a fire in winter. He rests for a time in an easy-chair, and then slowly undresses or is undressed at the hearth, taking care never to get out of breath in the process. Having completed his toilet, he puts on a long woollen night-shirt reaching to his feet, and is presently ready for bed. Here again there must be no precipitancy. He must on no account hasten to lie down. He must "*slip*," I might almost say in some cases "*sneak*," under the bedclothes, where he finds the sheets warmed for his reception and the pillows heaped or propped up, against which he reclines. Thus there is no dyspnoea from exertion, no sudden catch of the breath by the sheets "*striking cold*" on

his skin, no oncome of cough from attempts to assume the recumbent posture and force sleep at once. Sleep must be wooed, not compelled; and for this purpose there is no better means, beyond those measures just named, than a little indulgence in certain literature of a soporific kind, or the monotonous tones of the voice of a clever nurse or friend reading aloud, with a shaded light and an otherwise quiet room. In bad cases of phthisis, these attempts to get to sleep without exciting cough may be critical; and there is much need felt by the patient for a sense of companionship and comfort and absence of all effort and anxiety. If this plan fail, and not until it has failed, medicines are to be given for the cough. I would first try some simple linctus, such as this:

R Spirit. chloroformi, ℥iij;
Succi limonis, ℥xv;
Mucilaginis acaciæ, ad ʒi.

To be slowly sucked from a spoon; not taken with water. If this also fail, then I would add morphine sufficient to control the cough and promote sleep,—say ten, fifteen, or even twenty minims of liquor morphinæ acetatis,¹ as required. Bedtime is the fit and proper hour for an hypnotic, and for morphine as a respiratory sedative. Other combinations of morphine or opium will commend themselves to you according to circumstances.

3. *Cough in the Night*.—However successfully he may have been got to sleep, the phthisical patient will be disturbed by cough during the night; it may be very shortly, and it may be several times. The causes of this *tussis per noctem* are accumulation of the secretions, exhaustion and consequent irritability of the nervous centres, and activity of the disease with pyrexia and general discomfort and restlessness. The principles of rational treatment are discovered by these considerations. They are to permit occasional waking and expectoration; to remove or prevent exhaustion; to relieve disturbing symptoms; and, finally, to encourage sleep thereafter.

The plan to be followed to fulfil these indications may be thus stated. Nocturnal cough, while moderate, brief, and effectual, is permitted; but if it be excessive, useless, or exhausting, it is checked by means of respiratory sedatives, nervous and circulatory stimulants, and nutritive measures, beginning with the simplest. These are:

(a) *Warm Food*. Every phthisical patient who suffers from nocturnal cough should be instructed to feed himself or be fed in the

¹ Containing one per cent. of morphine acetate.—Ed.

night. If he have no nurse, the table by his bed will be furnished with a "night-light feeder" containing either milk or broth, to which he must help himself when roused by cough. Some patients find cold fluids more successful expectorants than warm.

(b) *Stimulants.* In some instances food fails to relieve the cough and exhaustion, particularly when vomiting occurs. It is then good practice to order a small quantity of stimulant to be taken with the broth or in the milk,—brandy, whiskey, or port. And if these fail and the cough is persistent and harassing, another dose either of the simple or of the morphine linctus must be allowed. The night feeding may have to be repeated once or twice before the morning. Judgment must be exercised with respect to the allowance of stimulants and morphine.

4. *The Morning Cough.*—When the phthisical patient wakes and stirs in the morning, and still more when he rises, cough is sure to seize him. This morning cough is usually characterized by the most abundant expectoration of the twenty-four hours. The principles of treatment are now simple: they are to assist expectoration, to refresh the system, and—an important negative indication—to avoid narcotics. The night is over; if further sleep be taken, it is more of a light slumber. This part of the treatment of phthisis is the complement of the management in the evening, which you remember consists in good part in reforming the unwholesome habit the patient has contracted, of inverting the day and night. The person who has retired at nine o'clock will be prepared to rise with other people; he will not "lie about" in bed into the forenoon. Therefore there must be no more sedative linctus given in ordinary cases,—no more, indeed, until the return of night. The morning cough is to be partly assisted, partly controlled, by food in the form of *the early breakfast*. This is to be brought into the room, say at six or seven o'clock, according to circumstances, and may consist of cocoa or tea, with bread and butter and perhaps an egg in some form. Other patients prefer milk, or the popular rum and milk, particularly such as have had no occasion to feed themselves in the night,—the kind of refreshment varying with taste, digestive ability, and the events of the preceding hours.

The effect of this welcome food is soon appreciable. The vigor of the cough is increased; the sputa are more liquid because the secretions are unloosed; and the larynx and throat generally are better adapted by the demulcent fluids to complete the acts of cough and expectoration. A sense of increased comfort and strength pervades the patient's system, and he may feel disposed to slumber for another short period

of an hour. During this time he may perspire; but the sweat is moderate and warm,—not excessive, cold, and debilitating as in the patient who has retired late, lain awake half the night coughing, and at last fallen into a heavy sleep as the result of accumulated doses of opiates.

5. *Cough after Meals.*—One of the most distressing forms of cough in phthisis is cough after meals. It is not only apt to be severe, harassing, and exhausting, but often ends in sickness, and complete loss of precious nourishment, taken perhaps with difficulty or actual distaste.

The subjects of cough after meals are usually, in the first place, severely stricken by the disease. Secondly, they have cavernous phthisis, and the cavity or cavities may be surrounded by dense, tough, airless consolidation; or become dry and contracted or very large; or they are situated in the lower lobe, where evacuation is more difficult and the attempt at clearance more frequent, severe, and ineffectual. Besides these features of the case, we frequently find the throat and stomach peculiarly irritable, and occasionally there is distinct gastro-ectasis. It is not difficult to suggest various explanations of this cough after food, and of the attendant sickness. The pharynx, it may be said, being already irritable from incessant cough, is excited by the passage of food,—an event familiar to all of us in some kinds of chronic sore throat; and reflex vomiting is the natural consequence. Or it may be reasonably urged that the cough-centre and the vomiting-centre have very closely corresponding or associating boundaries; and that if the cough-centre discharge inordinately, as in the convulsive cough of phthisis, the nervous force liberated overflows its proper limits and involves the vomiting-centre. It is difficult to resist this conclusion when one witnesses an attack of the convulsive cough of phthisis after dinner, ending in sickness. It is necessary, perhaps, to assume that the vomiting or gastric centre is also irritable,—the effect, naturally, of the dyspepsia from which, as we have seen, the patient so often suffers.

The treatment of this kind of cough taxes our therapeutic resources very severely. We have no very clear indication to guide us, excepting the main one,—to arrest the unhappy symptom, an indication far too general to be of much service in the selection of a remedy; indeed, it leads one too readily to the intemperate employment of sedatives, which ultimately increase the indigestion, diminish the appetite, constipate the bowels, and relax the skin.

For myself, I have tried many kinds of treatment for this condi-

tion ; mainly after an empirical fashion, guided by such observations and considerations as I have just laid before you.

I have made a faithful trial of rest after meals. The patient was directed to lie down at once on completing his lunch or mid-day dinner ; and to go to sleep if possible. If this plan failed, I advised him to have his meals reclining on a couch, and to let the table be removed from him, instead of his retiring from the table, when the meal was over. I have often got satisfactory results from this device, which is a most intelligible one, as all will admit who have had much experience in the treatment of vomiting by rest, particularly in gastric ulcer, or even of ordinary diarrhoea or other irritable state of the alimentary canal. I honestly confess, however, that bodily rest may fail to check the convulsive cough and vomiting of phthisis, and we must try other means.¹

Regulation of the diet may fulfil the desired end, and ought never to be omitted. This is not the occasion for discussing the diet in phthisis ; it will be enough to say that the food, while highly nutritious, must be as light or digestible as possible. In these cases beer, so often taken with relish and benefit by the phthisical, appears to be peculiarly unsuitable,—increasing the cough, deranging the stomach, and aggravating the sickness. Preparation of the stomach for the reception and digestion of the food, by a few minutes' quiet bodily rest and the exhibition of a light alkaline bitter stomachic, with or without diluted hydrocyanic acid or bismuth, shortly before the meal, greatly assists our efforts to aid gastric activity.

A method recommended by Dr. Douglas Powell for the treatment of secreting or ulcerous cavities sometimes answers well. This is counter-irritation of the chest-wall over the large cavity which so often exists. It well deserves a trial, cantharides being used to establish the blister, and savine ointment rubbed in to keep it open for a week or ten days. The urgency of the vomiting in some of these cases, calling as it does for active treatment, has induced me to try the effect of blisters to the epigastrium in every instance of severe paroxysmal cough, whether ending in sickness or not. The results have been satisfactory. Sickness is often controlled, and cough may be remarkably relieved. The method of use and the management of the epigastric blister are not peculiar. It may be well to keep the blistered surface open by means of savine ointment. I need not say that strict atten-

¹ In still more severe cases the patient is ordered to keep his bed altogether for a few days.

tion to diet and other obvious measures calculated to check cough and sickness have been combined with the vesication in these cases. How this method controls cough it need hardly detain us in the course of a clinical lecture to inquire. But I may suggest, as we have found how much the gastric condition has to do with the symptoms, and how far the centres share in the irritability of the mechanism, the counter-irritant probably allays cough by depressing or soothing the gastric and respiratory centres.

Persistence of severe cough and sickness steadily increases the patient's debility; and this, in turn, increases the irritability of the centres. Thus a vicious circle is established,—bad leads to worse. An obvious indication under these circumstances is to maintain or restore the general strength, and the digestive and respiratory vigor in particular. It has occurred to me that strychnine might fulfil this indication, and I have tried it in the form of the usual hypodermic injection,—one minim of the liquor strychninæ hydrochloratis,¹—either before or after meals. In some instances the result has been good, and the method appears to deserve further trial, particularly in cases of extensive active phthisis with increase of debility, failing respiratory vigor, and difficult as well as severe cough and vomiting.

Is morphine of any use in these cases? No doubt it is, but it is not to be recommended except in hopeless conditions.

6. *Excessive Cough at any Time.*—I will conclude this imperfect discussion by referring briefly to certain measures which may be tried in the excessive or ineffectual cough of phthisis at any time. A large number of remedies belonging to different orders might be mentioned here. There are also many small details of the treatment of severe cough which could be profitably discussed did time permit. However closely, also, we may attempt to pursue definite principles in cases of this kind, we must test the value of empirical remedies or of measures that may suggest themselves to our judgment as worth a trial.

We may attempt to relieve cough by various applications to the throat. The best of these, in our experience here, are the following:

Pounded ice, swallowed (not sucked), will often arrest paroxysmal cough, but it is apt to cause flatulence.

Menthol inhalations, consisting of twenty minims of a twenty-per-cent. alcoholic solution of menthol dropped on the sponge of an ordinary inhaler, are often successful. So are pure menthol lozenges.

A warm alum spray (3ss of glycerin of alum to 3vi of water)

¹ Containing one per cent. of strychnine.—Ed.

may be used with a Siegel's apparatus for a few minutes occasionally. It is not very successful in my hands. A cold alum spray may answer better,—a similar solution applied with the hand-ball apparatus.

A cold solution of morphine (strength, $\mathfrak{z}\text{i}$ of liquor morph. acetatis to $\mathfrak{z}\text{i}$ of water), twenty strokes of the hand-ball when the cough is very urgent, or after meals, or a morphine insufflation (one-twelfth—or less or a little more—of a grain of hydrochlorate of morphine in two grains of powdered starch, insufflated just before or after meals), are often very valuable, particularly in laryngeal phthisis with painful cough and dysphagia. The morphine often induces sleep in the course of a few minutes. The ordinary morphine linctus, such as I recommended for use at bedtime or in the night, may be given, as we have seen, in very urgent or advanced cases, during the day also. The inhalation of a few drops of chloroform from a bit of lint will sometimes break the paroxysm of cough.

In this summary of the management of cough in phthisis I have attempted to follow something like a rational system ; I have searched for principles in the pathology and clinical phenomena, and tried to conform our recommendations to them. Necessarily the attempt has been but partially successful. One practical line you have been able to follow running through all my recommendations,—the avoidance of sedatives—at any rate, of opiates—in a routine fashion. I wish not to be misunderstood on this subject. No one can possibly value more highly than I do the use of morphine generally, and in diseases of the respiratory organs and of cough in particular. With the hypodermic syringe, the many forms of opium preparations for ordinary exhibition by the mouth, the insufflator, the spray, the linctus, the lozenge, one can afford such comfort of mind and relief of bodily distress and exhaustion in phthisis as are not to be obtained by any other measures or combinations of other measures. But, as I have already said, the benefit may be very dearly bought. Opium is often actually dangerous in lung-disease, or when used to relieve respiratory symptoms in diseases of the kidneys and heart. But short of danger, it may lead to infinite harm, by destroying the appetite, and interfering with digestion, the all-important functions of the intestinal tube, and the activity of the liver. It increases the sweats, dries the mouth and throat, and leaves the patient drowsy and indisposed to rouse and exercise himself. He slumbers throughout the late morning in his close bedroom, loses the purest and most invigorating portion of the day

out of doors ; rises late, peevish, anorexic, headachy, and unrefreshed, and spends the evening in an ill-ordered, unwholesome fashion.

The effect of the rescue of phthisical patients from this unfortunate management of themselves and their time is highly gratifying, with the establishment of a natural or rational system of management, introduced by a mercurial purge and the exhibition of salines or mild alkaline stomachics.

Lastly, let me repeat, the cough of phthisis must never be treated by routine. Whether opiates be given or not, let us be careful not to treat every case or every instance of cough by a stock mixture, whatever the time of its occurrence and the other circumstances under which it arises. If we always approach the treatment of the cough of phthisis in this spirit, we shall not only be more successful in our results, but find them a subject of much scientific interest.

PNEUMONIA; CIRRHOTIC KIDNEY AND LIVER; FIBROID DEGENERATION OF THE HEART.

CLINICAL LECTURE DELIVERED AT THE BELLEVUE HOSPITAL.

BY ALFRED L. LOOMIS, M.D.,

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New York.

PNEUMONIA.

GENTLEMEN,—This patient, who is thirty years of age, and a brick-layer by occupation, says that he was perfectly well up to ten days ago, when he was suddenly seized, while on his way home at night, with chills, followed by fever. He had had fever and ague some years before, and this attack seemed to him exactly like those from which he had formerly suffered. He says that he was not drinking at the time of this attack, and he denies drinking to excess at any time. On the following morning, Sunday, he felt well, but another chill, followed by fever, occurred on Monday morning, and on Tuesday pain developed in the right shoulder, which was noticed principally upon inspiration. There were no more chills, but the pain continued up to Thursday, when cough and yellowish expectoration were added to the other symptoms. The expectoration was abundant and quite tenacious; on Friday it was rust-colored sputum, and on Saturday he was admitted to the hospital. On Sunday, December 6, the temperature was 103° F., and on the following morning it was 104½°. At present it is 103°. The respirations have ranged from 30 to 36, and the pulse from 104, at the time of admission, to 114. It is more rapid to-day than at any time since his admission. Examination of urine negative.

The pain of which he complains is undoubtedly due to the pleurisy which commonly ushers in a pneumonia. Such pleurisies have the same etiology and morbid anatomy as the pneumonia. I wish you to notice particularly the character of the pulse: it is not only rapid, but irregular and intermittent, notwithstanding the fact that the patient is taking one ounce of whiskey every two hours. His skin is bathed in a

profuse perspiration, and this, with the continued elevation of temperature, indicates danger. The apex-beat, although feeble, is in its normal position, and the heart-sounds are more indistinct than one would expect from the pulse. They are of about the same length and very indistinct. There is a confusion of the heart-sounds which, whenever present in an acute disease, should be looked upon with suspicion. There is complete dulness over the right apex anteriorly, with bronchial respiration and crepitant râles; and below this there is very distinct pleuritic crepitation. On the left side there is some dulness, with bronchial respiration over the central portion of the lung, and over the whole of the left side posteriorly the respiration is broncho-vesicular. You notice that, although this patient has been in the sitting position only for a moment during the physical examination of the chest, his pulse has become very feeble and rapid. There is also a little blueness of the lips and slight cyanosis is noticeable over the body and hands.

Our diagnosis, then, is fully-developed acute lobar pneumonia of the right apex, with a pneumonia just beginning on the left side. Apex pneumonias occur in old age and as complications of acute diseases; when found in a man of this age and appearance, it is, nine times out of ten, of alcoholic origin. It is this alcoholic condition which in this patient complicates the pneumonia and renders the prognosis very unfavorable. The extension of the pneumonia to the other lung, the irregular and feeble action of the heart, and the interference with the surface circulation, when taken in connection with the history, all favor a very grave prognosis.

There is one peculiarity which it is well to notice, and that is that the patient suffers very little from dyspnœa. Dyspnœa in pneumonia does not depend upon the extent of the pneumonic process, for I have seen persons with double pneumonia involving most of the pulmonary area lying as quietly and breathing as easily as this patient. A respiration of 60 per minute in pneumonia is very common, and yet this man's respirations are 36, and have not reached higher than 40. Dyspnœa in pneumonia is due in very many instances to nervous conditions, hysterical women and nervous men with pneumonia often suffering very severely from rapid and difficult breathing. As a rule, there is more dyspnœa when the pneumonia is at the apex than when it is at the base, although there are many exceptions to this statement.

This man's condition indicates the necessity for an increase in his stimulants, though experience shows that, when twelve ounces of whiskey in the twenty-four hours fail to support the heart, more than this will not save the patient, except when it is given to tide him over a

dangerous period. At present our patient is undoubtedly suffering from the shock incident to the extension of the pneumonic process to the left lung.

I have said nothing about the use of digitalis, for I have yet to see a case benefited by this drug, except when the pneumonia was complicated by Bright's disease. More than this, I am pretty sure it does harm. When the point is reached at which alcohol fails to hold the heart, digitalis will usually fail to do it, and will, in many instances, make it more irregular and intermittent. I am aware that I am not exactly orthodox in making this statement, but I am simply giving the result of my bedside experience. Some would advise the use of carbonate of ammonium; I have not found it as serviceable as the chloride of ammonium, and prefer the chloride if any ammonium salt is used.

In the early stages of pneumonia, when the nervous system is overwhelmed by the shock of the onset, opium does a great deal of good; but later on it is hardly safe, especially when there is so much cyanosis as exists in this patient.

In addition to medication, the patient must be given plenty of easily-digested food, and must be kept very quiet; he should not even be disturbed often for the purpose of examining his chest. I have just come from consultation with a well-known and most judicious practitioner in this city who has had an exceptionally large experience during an active practice of at least forty years. The patient was in the second stage of pneumonia, and had a temperature of 105° F. When I asked the physician concerning the treatment of his patient, he replied that it consisted of food and rest, for he did not believe in using any medicinal agent in this disease. He would not even adopt any antipyretic measures, for he thought that the fever was not harmful, but was a necessary part of the disease and of itself would do no harm. I quote these remarks because they emanate from a man whose word carries much weight.

I cannot more appropriately close these remarks on the treatment of pneumonia than by alluding to a most interesting research, made last spring, into the results of the various methods of treatment of pneumonia which have been in vogue at the Massachusetts General Hospital during the past seventy-five years. The cases were examined by decades, all possible sources of error were eliminated, and then they were carefully tabulated. During the period covered by this investigation bleeding had prevailed, the antimony and calomel treatment had been largely practised, the let-alone treatment had had its day, the

stimulating treatment had been tried, and, lastly, the antipyretic treatment had been in use. These cases were all seen and treated in a hospital where great care is taken as regards diagnosis and the keeping of accurate records. A line was then drawn to represent the mortality during this long period under such widely-differing methods of treatment, and, strange to relate, this line was nearly straight. This speaks for itself.

REMARKS MADE AT THE SUCCEEDING CLINIC.—Here is the case of croupous pneumonia which was here last week with blue lips and a wavering pulse. You remember that the outlook was bad. He walks into the clinic to-day, recovered from his pneumonia, a few pleuritic cracklings only remaining. He now complains only of weakness. You will remember also that I said, when he was before us last, that it was not a long road either to recovery or to death; he has, fortunately, taken the better horn of the dilemma. I suppose you want to know what has cured him. When we saw him last he was taking twelve ounces of whiskey, and I told you that usually, if twelve ounces in twenty-four hours would not overcome heart-failure in pneumonia, twenty would not do it. But you must remember I stated that this man was taking "hospital whiskey," which is not full strength. After he went from the clinic, a week ago, his whiskey was doubled in quantity, so that I suppose he received about the equivalent of alcohol in twelve ounces of good whiskey. His heart responded at once to this increase, and in forty-eight hours he commenced to convalesce.

This is an important case to you, for it shows that often in pneumonia a critical period is reached when a large quantity of alcoholic stimulus will tide a patient over a dangerous period to a safe convalescence. Of course, the age of this patient was in his favor; had he been fifty years old, he probably would not be here to-day, for there were many symptoms about him which were very unfavorable, particularly the condition of the heart and general circulation. I am always glad to show you such cases, for they cannot but make an impression upon you, and I trust this one will teach you not to turn your back on a case of pneumonia until it turns its back on you.

CIRRHOTIC KIDNEY AND LIVER.

This man is thirty years of age, and has pursued his trade of painter for about fifteen years. During this period he has had painter's colic twice, and it has been followed by "drop-wrist" on both sides. He says that he has been a steady drinker for at least ten years, and that

he has frequently been intoxicated. For two or three years he has been accustomed to use alcohol before breakfast. His father died of paralysis at the age of sixty, and his mother died of some acute disease. A brother had hip-disease, and one sister died from disease of the stomach. He has never had bleeding of the gums, but his teeth have become loosened, as he thinks, from chewing tobacco. He has had no cough except a morning cough, which troubled him most just before his accustomed early morning drink of gin.

About one month ago he noticed that his urine was scanty, whereas for several months previous to this it had been very abundant. Two months after this his feet began to swell, and he had vomiting, headache, dizziness, and specks before his eyes, but no dimness of vision. He attributes this sickness to an exposure a few days before he noticed that his urine was becoming so scanty. The exposure was quickly followed by chilly sensations unaccompanied by fever. Then he first noticed swelling of his feet, and later of his hands, most marked at night. He has been somewhat short of breath on slight exertion.

This history, gentlemen, is quite suggestive, and the intemperate habits of this patient, particularly his drinking before breakfast, and the history of lead-poisoning are the chief factors which at this stage of the investigation of his case would lead us to a diagnosis of a cirrhotic kidney and liver. I suppose that, next to gout, lead-poisoning is more likely to lead to cirrhotic kidney than any other condition, not excepting alcoholism. When cirrhotic kidney is associated with chronic alcoholism, it is usually accompanied by cirrhosis of the liver, but cirrhosis of the liver does not necessarily occur with gout or with lead-poisoning. Inspection shows extreme anæmia, and an œdematous countenance. He presents the general appearance of great physical vigor.

Notwithstanding the evidences of cirrhotic kidney and liver, there is no evidence of arterial sclerosis; there is no "piston-pulse" here, but, on the contrary, the pulse is soft and feeble. How do you account for this? The patient says that some time ago he was troubled with violent cardiac palpitation during active exercise, and we find the apex-beat of the heart two inches to the left of its normal position, and there is marked evidence of cardiac enlargement. But you say, if the large heart were due to arterial changes or obstruction of the circulation, the pulse would show high arterial tension. So it would were it not that the hypertrophied heart-walls have undergone changes that allow of dilatation of the heart-cavities. This always occurs sooner or later whenever left cardiac hypertrophy is associated with cirrhosis of the

kidney. So long as there is sufficient power in the heart to overcome the obstruction in the arteries, the pulse will show high tension, but, when degenerative changes occur in the heart-walls, the pulse will begin to be feeble, and the patient will develop œdema, even though there be no acute renal complication.

Percussion shows that the left lobe of the liver is diminished, but that the right lobe is of normal size. There is a slight increase in the splenic area. The abdomen is tense and tympanitic, and there is fluid in the peritoneal cavity. The entire body is œdematous, most markedly in the lower extremities. On auscultation, the heart-sounds are found to be feeble and rather indistinct; there is no murmur over the heart, but one is audible in the neck, accompanying the first sound of the heart. Posteriorly there is flatness on percussion about two inches above the lower portion of both pleural cavities, and a marked change in the voice at the upper level of this flatness. No cracklings are heard over the chest, and no change in the respiratory murmur until the points already mentioned are reached, when it is lost. This tells us that there are two or three inches of fluid in the pleural cavities. He has, therefore, hydrothorax, ascites, and general œdema, or, speaking of these conditions collectively, he has general anasarca. The fact that there is fluid in the abdominal cavity, although there is no apparent obstruction to the portal circulation, as evidenced by the vessels on the surface, would lead to the conclusion that there is nevertheless some obstruction to the portal return in the liver or in the heart. His pulse is more feeble when sitting up than when lying down.

The urine has a specific gravity of 1020, is of light color, and contains large quantities of albumin, but no casts were found on two examinations. If an acute parenchymatous nephritis had been engrafted on a cirrhotic kidney, we would expect casts in the urine. We may account for their absence here by supposing that he is just recovering from a tubular nephritis, that the casts have already disappeared, and that the albumin remains, because it is always slow in disappearing in such cases. This is a fair explanation, but there is another way of explaining it. From the large quantity of urine passed for months before his present illness, from his habits of life, and from his occupation, there is little doubt that he has a cirrhotic kidney, and that he has had hypertrophy of the walls of the left ventricle; but it is especially to be noted that these conditions are associated with chronic alcoholism. Now, the chronic alcoholism led to heart-failure; and the weakened alcoholic heart is no longer able to overcome the obstruction

to the general circulation. Under such circumstances general anasarca will often develop rapidly, on account of acute heart-failure, without any new renal complication.

The important point in this case is to determine whether the patient really had a parenchymatous nephritis, for on this depends the line of treatment to be adopted. He has improved since admission, having received calomel, alkalies, and digitalis, both in the form of the tincture and infusion. If he had had an acute parenchymatous nephritis, the administration of digitalis, and the consequent increase in the quantity of urine, must, I think, have given us casts; hence, although the history inclines to this condition, I should hesitate before being positive that he had had an acute nephritis engrafted upon a chronic cirrhosis.

So far as treatment is concerned, I have but little to add to that which he has already received. I should give digitalis so long as it increased the quantity of urine until the anasarca disappeared, but, if it fails to do this, I would stop its use and depend entirely on eliminatives.

IBROID DEGENERATION OF THE HEART.

This man tells us that his present illness dates back three years, at which time he first noticed that he had some shortness of breath on slight exertion. Previous to this he had always been well; the members of his family were all long-lived, and those on the paternal side were inclined to be quite stout. He is accustomed to drink liquor freely, but does not become intoxicated. He is now exceedingly obese, and this accumulation of adipose began about thirteen years ago. At one time his weight was three hundred and fourteen pounds. The shortness of breath developed slowly and was not accompanied by any cough; in fact, it was rather a sinking feeling about the heart than a distinct shortness of breath. It is becoming steadily worse.

There is one point of interest in connection with the history, and that is that the stoutness is a family trait on the father's side. There are many people weighing two hundred and eighty or three hundred pounds who are in perfectly good health.

You see how impossible it would be to determine in a man so stout as this the position of the apex-beat of the heart. His respiration is labored, and the effort of taking off his clothing has caused marked cyanosis. Percussion is not very serviceable here on account of the large amount of fat on the surface of the body, but we are able to make out that the hepatic dulness extends below the free border of the ribs. Sibilant râles are heard over the anterior portion of the chest, and the

respiration is wheezing. You see, as he lies down on his back, how quickly his face becomes red and turgid, and he tells us that he cannot go to sleep in this position, but must turn upon one side. The arteries feel hard, and the pulse at one moment shows high tension, and at another becomes feeble and somewhat irregular. This indicates the existence of some arterial change. Although it is difficult to determine the exact size of his heart, it evidently is considerably enlarged. The heart-sounds are audible two inches to the left of their normal position; the first sound is short instead of having that long, full, characteristic sound of a normal heart. There is no audible murmur. The lower extremities are discolored, and pit on pressure; the oedema is evidently chronic. This patient has been getting more short of breath for the last three years. The popular explanation of this would be that it is because he is getting fat; but a simple increase of adipose will not of itself do this. Such a condition is always connected with some change in the heart, the most frequent cause being fatty infiltration. I have not found that it is more likely to occur in persons who are hereditarily predisposed to fatty conditions than in others. If he had fatty infiltration of the heart, which would cause the condition of the circulation which exists, his heart-power would be so far interfered with that he would be unable to come up-stairs to this clinic. But there is evidently quite extensive arterial sclerosis which assists in determining the condition present in this patient, and this arterial change has probably been developing for a long time. A free use of alcohol, a sedentary life, and large eating all favor such a change; and this is just the history which this man has given us. At first there was cardiac hypertrophy, but during the last two or three years this has not been sufficient to compensate for this continued obstruction, and, as a result, there has been interference with the return circulation, giving rise to cardiac palpitation, so that the patient feels an unpleasant sensation about his heart, which he describes as a shortness of breath. The changes which usually occur in the heart under such conditions are fibroid rather than fatty, although the two conditions may co-exist. If you could examine his liver and heart microscopically, you would find fatty infiltration and fibroid changes combined. It is this fibroid change which is especially dangerous in this class of subjects; for it will be accompanied sooner or later by indications of kidney insufficiency. In this case, from his history and the results of the urinary examination, we may assume that there has been a combination of cirrhotic changes in the kidney with attacks of acute parenchymatous nephritis; so that at times the urine has been of low specific

gravity and abundant ; and at others has been scanty, highly colored, and of high specific gravity, and has contained exudative casts.

Remember, then, that a man may be predisposed to a large development of adipose, and that even if he lead a carefully regulated life, he cannot prevent its development, nor can he prevent some fatty infiltration about the heart, liver, and other organs ; but this infiltration will not give rise to serious dyspnœa. But if such patients lead irregular lives and become alcoholic, they are liable to develop arterial changes. This man has had the signs of beginning heart insufficiency for a long time ; and even if we should now put him upon a strict diet, containing but little sugar and starch, and give him systematic exercise, we might reduce his weight and relieve him somewhat of his dyspnœa, but the arterial and kidney changes would not be arrested. If you restrict the diet and establish systematic, physical exercise in one who has simple obesity, it is wonderful how much improvement will take place. Such persons will not only lose weight, but be permanently relieved of their dyspnœa, while the class represented by the patient before us will not, and I question whether it is safe to subject such a case to this line of treatment. There is more or less danger of increasing the heart insufficiency by such a course and thus hastening the fatal issue. This statement is founded upon my experience in attempting this treatment in similar cases. You are very likely by a restricted diet to interfere seriously with their nutrition. Especially is this true in chronic alcoholic subjects. I am greatly in favor of dietetic treatment in cirrhotic kidney ; but you must be careful never to change the diet sufficiently to interfere with nutrition in chronic alcoholic patients. If they express themselves as feeling weak under restricted diet, it should be made more generous, and perhaps even stimulants will be demanded. If a trial should show that this man is less able to exercise than before, even though his dyspnœa were relieved, it would not be safe to continue this plan of treatment.

HYDROTHORAX (PYOTHORAX?) WITH DEXIO-CARDIA.

CLINICAL LECTURE DELIVERED AT THE WESTERN INFIRMARY, GLASGOW.

BY W. T. GAIRDNER, M.D., LL.D.,

Professor of Medicine in the University of Glasgow, Physician to the Western Infirmary, etc.

PREVIOUS HISTORY OF PNEUMOTHORAX: QUESTIONS ARISING—TUBERCLE? RELATION OF PLEURISY TO PHTHISIS PULMONALIS AND TO PNEUMOTHORAX: TREATMENT BY INCISION.

GENTLEMEN,—I propose to bring before you to-day the leading facts of a very interesting case recently admitted to our male ward. I am afraid you will scarcely have the opportunity of following out this case fully before the Christmas holidays; while, on the other hand, it is absolutely necessary now to take a somewhat comprehensive view of the facts in order to enable you to grasp their true significance, not only as regards this particular patient, but also as bearing on certain general questions of pathology and of diagnosis, the importance of which you will not fail to recognize when I have placed them before you in the course of this lecture. The broad facts of the merely physical diagnosis have, I understand, been already demonstrated to the juniors among you by Dr. Hawthorne, and they are very simple and very easy to exhibit and to explain. I do not, therefore, propose to enlarge upon this diagnosis at present, when we have not the patient actually before us. Dulness on percussion all but universal and complete, on the left side of the thorax, extending from the clavicle to the extreme base; *dexiocardia* (as Dr. Stokes called this condition long ago), in which the heart pulsates almost as far to the right of the middle line as in normal circumstances it does to the left; a certain amount of displacement of the upper mediastinum, and a certain amount of relative fulness in the intercostal spaces on the left side with deficient mobility; these are some of the physical signs which in this case indicate hydrothorax (or, it may be, pyothorax or empyema), and which

cannot possibly be interpreted otherwise. Those of you who have witnessed these facts will not easily forget them ; those who have not will find them all set forth exactly as we have them in this case in every text-book and every systematic work on medicine or on physical diagnosis. I do not therefore need to dwell upon that in this lecture, when we have other points of great importance to occupy us.

Perhaps Dr. Hawthorne was not aware, when he used this case for your instruction as a perfectly plain and unequivocal example of hydrothorax, that we have a previous knowledge of this same patient, rather more than a year ago, when we had repeated opportunities of verifying some facts not now to be discovered, because the state of the patient has undergone a change ; and I will add, a change that is of the last degree of importance and interest, as bearing on the whole history and probable pathology of the case and of the conditions now existing ; so that it is absolutely necessary to study the case under both aspects in order to properly understand what is now presented. Simple pleurisy with effusion, whether serous or purulent, or in transition from the one to the other kind, is common enough ; and simple unilateral pleurisy with effusion (as you will find in all your text-books) does not at all imply, however it may in some cases suggest, any other disease lying latent behind the one revealed by the physical signs. But *an apparently simple pleurisy, determined by a previous pneumothorax, a hydro-pneumothorax, the air in the pleura becoming replaced by fluid to a like extent, and the air disappearing altogether from observation*,—this is not quite so common. But this order of events is so thoroughly in evidence in the present history, and so very important for your instruction, that I make no apology for referring to the previous record in the hospital journals just as if I had to lecture upon it now for the first time.

Fortunately, we have an abstract, or summary, which (as written at the time for class purposes) will convey to you all the essential facts of the previous history and diagnosis, as recorded in November, 1889. We have also a set of manuscript notes of the opinions delivered at that time, carefully written out by our then pupil, and now graduate, Dr. John Munro Campbell, in a manner which leaves hardly anything to be desired. The journals themselves in detail are also accessible to you, and therefore it will perhaps be sufficient in the first place to read over to you the following brief abstract, which I should like you to place upon your notes *verbatim*, as it was given to the class last year, when the facts were carefully demonstrated, and eagerly watched in the process of their evolution.

Summary of Case of Alexander McL., aged twenty-four, engine-fitter, as between November 9, 1889, and January 17, 1890 (date of admission and dismissal). “*Pneumothorax* (left), probably tubercular, but with history ambiguous and obscure as to the date of perforation. Family history good. *Cough*, of sudden origin, in April, 1889, disabling him for drill practice, but not laying him up. *Pain* in left side, for the first time in June; continuing cough. Journey (by rail, boat, and carriage), involving much exposure, in July. Next day, *severe pain* in left side, without marked dyspnoea; first confinement to bed and severe illness about this time. Unable to lie on right side without choking and cough. Expectoration never profuse, nor of pure pus (such as might have been expected from rupture inward of an empyema). After this date, however (July), constantly a sense of ‘fluid in chest’ (careful inquiries leave no doubt that this was the so-called Hippocratic succussion or splashing felt and heard as such by the patient). Temperature normal. (Condition of patient in detail, as tested by weight, temperatures, physical signs, etc., were submitted to the whole class on two occasions specially recorded, of which the following may be taken as the result, in abstract). Dismissed after ten weeks’ treatment. Air in pleura completely replaced by fluid; but no evidence either of suppuration or of such distention as to make paracentesis imperative. Decision against interference, on grounds stated, after full consideration.” (Journal UU, Ward 1, pp. 52, vol. lxx. 124, etc.)

Such are the mere headings, or briefest possible indications of a diagnosis made in 1889, and which cannot, I think, possibly involve any mistake. If there are any now here who were with us on these occasions, they will remember that we laid the patient over in different positions so as to alter the fluid-level in its relation to the air, and found the position of the highly tympanitic and of the dull percussion on the left side of the thorax to alter accordingly. This was on November 15, 1889. On December 12 (just about four weeks later), a renewed class demonstration on the same lines as before showed to every one that the conditions had entirely altered, and that it was impossible at the later date to get any of the signs of the presence of air in the pleura that existed at the earlier. The state of the patient in other respects continued unchanged, but he lost entirely the sense of the Hippocratic succussion, which he expressed—not unnaturally—as a “feeling of fluid in his chest.” And so it has continued ever since. He *has* the fluid, but has ceased to have the *feeling* of it, which resulted from its being jumbled up, when he moved actively about, with the air, like water in a half-empty cask.

Now, this is the simple narrative of a course of events which, although probably new to some or most of you, is by no means so to me. Compare a case with very precise details as to time, etc., in which a pneumothorax, unquestionably tubercular and accompanied by severe hæmoptysis, was completely replaced, first by serous and then by purulent effusion, within about six weeks (*Glasgow Medical Journal*, 1865, vol. xiii. page 161, and other cases referred to in foot-note at page 164). It is, nevertheless, sufficiently uncommon, not to say rare, as to make it desirable to use the occasion for some more general remarks than I commonly introduce into a clinical lecture, in which, as a rule, each case or group of cases should teach its own lessons, if possible, apart from all highly elaborated systematic or doctrinal statements. But before leaving these more immediate lessons of the case, as we have them before us now, I would desire you to remark, as you may readily do in the ward, the entire absence of any symptoms of urgency in this man. His condition throughout (so far as we have had cognizance of it) has been exactly the same as you observe it to be at present. While the very marked changes in the physical signs that I have mentioned were in progress in 1889, there were no corresponding changes in the general symptoms. The patient was never confined to bed. He was never at any time unfit for a moderate amount of exertion. In fact, he is described, at one place in our old report, as "almost free from symptoms; he has no pain, little breathlessness, little cough, and almost no spit;" his general appearance was indeed a marked contrast to that of most of the patients in the ward, and might easily have been taken for that of a man in perfect health. He did not lose weight at all; or if he did so to a slight extent (two and one-fourth pounds), he made it up again while under treatment. In November and December, 1889, the temperatures, as carefully recorded twice a day, were almost normal throughout, in only one exceptional instance touching 100° F., the great majority of the evening temperatures being below 99° F., while among the morning temperatures a good many were below 98° F. After about ten weeks' residence, therefore, he was allowed to go home, not as being cured (for the physical signs remained stationary), but as not likely to be further benefited by treatment at that time. We had, however, under consideration at that time whether his side should not be punctured and some of the accumulated fluid removed—by aspiration or otherwise. We rejected that idea after due consideration, for reasons which appear in the report and on which I shall have occasion to say something further on. He now comes back to us, not on account of any material change

in what might be supposed to be the pulmonary symptoms, for he is still almost as free from them as he was last year, but he has discovered for himself a swelling, first noticed about a month ago, on the left side of the thorax, low down, which is in his own mind quite apart from anything that he has come to know about his own case; and this, on being carefully examined, proves to be very distinctly a fluctuating swelling, communicating with the interior of the thorax. In short, the fluid is slowly making its way to the exterior, and will shortly require surgical interference, possibly free antiseptic opening of the pleura. But still there is no urgency whatever, and none of the symptoms of a severe or a progressive disease. The temperatures, since his readmission, have been almost subnormal; pulse 76. The only other new feature that I have noticed, in addition to those just mentioned, is that the pulse is decidedly weaker in the left wrist than in the right, which (although there is no express note on the subject) I suspect was not the case formerly.

Now, all this is in strict accordance with what I have witnessed and taught for many years as to the "practical latency" of pneumothorax in some cases being not of very infrequent occurrence. And by this expression I mean that the "acute and terrible symptoms" (as Dr. Walshe has it) characteristic of this affection in typical cases may either be absent¹ or may be so completely merged in the symptoms of other diseases already known to exist that the precise date of the pneumothorax, as an incident, cannot be affirmed with any reasonable certainty. I think it was so even in the present instance; although there is a reasonable presumption, or even a probability, that the pain suffered in June, 1889, or the more serious attack in July of the same year, may have been the date or dates of the occurrence of perforation. But cases are not wanting in which the most careful inquiry fails to bring out even such an approximation to a probable date as indicated by symptoms. And in much more numerous cases the pre-existence of disease in the chest (chiefly, of course, phthisis pulmonalis) has tended so to mask the advent of the symptoms proper to pneumothorax that no reliable clue to the history can be obtained at a later date, even when the physical signs have made the fact of pneumothorax

¹ This, of course, only happens, or can happen, when the opposite lung—the one not involved in the pneumothorax—is nearly or quite sound; and, *per contra*, it is when pneumothorax takes place in consequence of merely incipient tubercle of one lung, the other being much further advanced in disease, that the most disastrous and rapidly fatal events occur.

as plain as it can ever be during the life of the patient.¹ Moreover, even when the date can be determined with tolerable exactness, as, for example, when it occurs in the course of a phthisical case under careful observation, the amount and character of the symptoms are often such as to lead to the conclusion that the actual occurrence of the perforation might easily have escaped observation, or has actually done so, at the time.² Dr. Walshe, whose authority on a subject like this is second to none, tells us that of the three leading symptoms of pneumothorax, —viz., sharp, often agonizing pain, sensation of rupture, and intense dyspnœa,—“the second is habitually wanting; and I have known perforation occur, as proved by physical signs and inspection after death, without any one of the three announcing its occurrence.”³ And Dr. Stokes has “known several instances where the first symptoms (of pneumothorax in phthisis) were not more evident than what we often see in phthisis from a new attack of irritation;” so that (he adds) “the disease may set in with violent symptoms, or be so latent that we cannot determine the date of its invasion.”⁴ And even if the patient has not previously been seriously ill, the pain and inconvenience are sometimes so slight as not to form an interruption in the first instance to ordinary occupations; as in a case carefully recorded by the late Dr. Thorburn, of Manchester.⁵ You will therefore do well never to assume that pneumothorax cannot have occurred, because you have no adequate history of the symptoms and date of its occurrence.

But if what I have said hitherto may seem to you to diminish the importance of pneumothorax as a clinical fact by showing you the small amount of actual disturbance by which it is attended in some cases, you will assuredly not be at all likely to minimize the importance of it in any individual case on this account, if you give due consideration to what I have next to state. For, even when it is least attended by formidable symptoms, pneumothorax means, in an over-

¹ This qualifying clause is not introduced here unadvisedly, or without actual experience of possible fallacies. See a very remarkable case of Cavity in Lung, simulating Pneumothorax, which I have briefly recorded in the Catalogue of the Pathological Museum of the Western Infirmary of Glasgow (published 1885), p. 70, Series 8, No. 78. The case is a most interesting one, but even a short narrative of it, such as to convey the diagnostic difficulties, would be out of place here.

² For detailed evidence of most of these statements, see my *Clinical Medicine*, 1862, p. 887; also *Glasgow Medical Journal*, new series, vol. ii., 1867, p. 191; and the earlier article above cited, 1865, p. 171.

³ Walshe, *Diseases of the Lungs*, fourth edition, p. 303.

⁴ Stokes, *Diseases of the Lungs*, pp. 527, 530.

⁵ See my *Clinical Medicine*, p. 382.

whelmingly large proportion of cases, if not in every case, a perforated pleura; and a perforated pleura carries with it the implication, in almost all cases not otherwise explained, of tubercular disease of the lung. And it was this general implication of probability, much more than any particular fact in the physical diagnosis or in the symptoms, that led to our placing in the summary just read to you the words "Pneumothorax—probably tubercular."

Let us see what this *probability* amounts to when stated approximately as a merely numerical estimate. Dr. Walshe, who has given a very comprehensive statement of the possible causes of pneumothorax, says that "it seems highly probable that ninety per cent. of cases of pulmonary perforation are really affiliated to extension of tuberculous ulceration through, or to tuberculous rupture of, the serous membrane."¹

In a much more recent and more extensive collection of facts by Biach,² being the whole of the cases of pneumothorax recorded in the three great hospitals of Vienna for thirty-eight years, I find that of a total of nine hundred and eighteen cases, seven hundred and fifteen were attributable to phthisis pulmonalis. This seems at first sight a smaller proportion than is given by Dr. Walshe; but in an estimate for clinical and diagnostic purposes it is requisite to exclude from the total of cases of pneumothorax, as here given, a considerable number in which there have been wounds of the chest, or other causes acting from without, such as empyema bursting either into the lung or externally, or, on the other hand, acute disorganizations easily recognizable, such as gangrene, etc., which are enumerated in the table in question. By making this exclusion we at once reduce the cases of *apparently idiopathic* pneumothorax to seven hundred and fifty-four, to which the phthisical cases stand in the proportion of about ninety-five per cent. In other words, *whenever pneumothorax occurs idiopathically in appearance, or with only a chronic disease of the lung recognizable as an antecedent, the chances are more than ten to one that the disease is tubercular.* It is necessary, of course to distinguish here between pneumothorax *ab extra*, especially that form of it which results from the perforation *inward* of a pleural effusion, or empyema, and pneumothorax *ab intra*, or that which comes by perforation of the pleura from within the lung. And this may in general be easily accomplished. In the present case, for example, there could be no question of rupture inward of an empyema, because (as you will observe) the summary already read to you shows that expec-

¹ Op. cit., p. 300.

² See table given in Eichhorst, *Specielle Pathologie und Therapie*, 4th ed., 1890, vol. i. p. 611.

toration was at no time such as to indicate a previous accumulation of fluid escaping through the lung. Cases of more difficulty might of course occur; but in this case we were able easily to eliminate all probable external causes, and thus to increase indefinitely the presumption of a tubercular cause.

Now, this large and indefinite presumption, amounting to very high probability, at least, of tuberculosis in a case like this, has certain bearings on diagnosis, prognosis, and treatment which I can only informally suggest, rather than discuss in detail, as a conclusion to the present lecture. We know very well, from pathological anatomy, the process by which tubercles in the lung lead up to pneumothorax in certain cases.¹

What has not been so commonly or so clearly indicated, either in books or in preparations as you find them in pathological collections, is the process by which a tuberculous lung is *hindered from becoming the seat of a perforation* (with pneumothorax) *which otherwise would probably occur in every case*. It is very easy to demonstrate, as in these preparations now before you (see Fig. 1), the fact of one or more openings in the pleura pulmonalis, communicating freely with a phthisical cavity in the lung. But it requires a long course of clinical and pathological experience, and very close watching of the relations between the two, to win the mind over to a full appreciation of the really important conservative processes taking place even in a phthisical lung, and which in many cases tend either to avert or to heal pneumothorax.

FIG. 1.



"PNEUMOTHORAX IN PHTHISIS PULMONALIS.—The preparation shows parietal and pulmonary pleura, the latter with three apertures communicating with cavities in the lung. The borders of these apertures are rounded, and they present the appearance as if a portion of the pleura had been punched out (slough of pleura). The pleural cavity in its lower part was found filled with air, while above, the lung was adherent. The case was one of great interest, and is fully recorded in journals of Ward 1, at two different dates. In the latter journal the pulmonary symptoms and physical signs will be found in detail, but it is impossible to give any adequate account of them here."—*Extract from the Catalogue of the Museum of the Western Infirmary, p. 69, Series 3, No. 26.*

¹ Several good authorities (West, Powell, Eichhorst) concur in giving about five per cent. as the observed proportion of phthisical cases in which pneumothorax is known to occur in hospitals. Eichhorst (*op. cit.*, p. 609) bases this remark on three hundred and ninety cases in the Zurich clinique, pneumothorax being verified in twenty. But as it is quite possible to overlook this accident in phthisis (as we have already seen), it is probable that this proportion is too low.

I wish, therefore, to ask your attention to this important aspect of the subject for a few minutes.¹

In the admirable sketch of the secondary lesions in phthisis which Dr. Coats has introduced into the fourth of his "Lectures to Practitioners," you will find the latest exposition, easily accessible to most of you, of what I regard as the true pathological relations of pleurisy and pneumothorax.² Dr. Coats affirms his conviction, founded on pathological experience, that acute pleurisy with effusion is not, as Trousseau believed, very apt to *cause* phthisis, but rather to *arise from* tubercles, or caseous deposits pre-existing in the lung. Chronic pleurisy resulting in adhesions is in fact "an almost constant accompaniment of phthisis" and arises in all probability from "the extension to the pleura of the diluted products evolved from the bacilli." But such chronic pleurisy, although arising indirectly from tubercle, is almost always non-tubercular, because "the lymphatic arrangements of the pleura are independent of those of the lungs, and there is therefore no extension by the lymphatics of the proper tubercular process to the pleura." As regards the blood-vessels it is otherwise. "The pleura is supplied by branches of the bronchial artery, which also supplies the general connective tissue of the lung and the subpleural tissue. This being so, the caseous necrosis of a piece of lung immediately beneath the pleura, involving as it does death of the smaller arteries and capillaries, will cause necrosis of the pleura lying over it, *provided no other source of blood-supply exists*. We have already seen that in most cases the adhesion of the two surfaces of the pleura provides for this additional supply of blood. . . . The practical result of a pleural adhesion is, that the pulmonary and parietal pleura coalesce, and their blood-vessels are brought into immediate communication. When this is the case, then obviously a necrosis of the lung beneath the pleura will not induce a necrosis of the pleura, because the latter will continue to be nourished by the vessels from the parietal layer. Even if a limited necrosis should occur beneath the adhesions through imperfect communication of the blood-vessels, we shall not have acute

¹ The views here set forth, with less of detailed illustration than is, perhaps, desirable, will be found at considerable length, and supported by numerous additional facts, in the chapter on Pneumothorax, published twenty-eight years ago in my *Clinical Medicine*, p. 394, *et seq.*

² *Lectures to Practitioners*, Longmans, 1888; On the Pathology of Phthisis Pulmonalis, p. 222; Acute Pleurisy and Pneumothorax. Compare also p. 186, on Chronic Pleurisy and Adhesion in Phthisis. Similar views are more briefly given in Dr. Coats's *Manual of Pathology*, second edition, 1889, pp. 673-676.

pleurisy as a result, because the necrosed surface will be shut off from the general cavity of the pleura by the adhesions."

You will see from these few sentences how the most advanced pathology, founded upon the bacillary origin of phthisis and of caseating pneumonia, tends to confirm the expression used by me nearly thirty years ago, that in relation to the progress of tubercular disease in the lungs, and especially as regards pneumothorax, pleurisy may, on the whole be regarded *not as a fatal complication, but as a healing power*. "In the course of pulmonary tubercle, we constantly, it may be almost said normally, see perforation of the pleura anticipated, and only just anticipated, by the formation of adhesions over the tuberculated portion of lung. *It is a curious and beautifully conservative arrangement*, that in those cases the pleurisy external to the lung usually keeps pace pretty accurately with the tubercle within; or, rather, that the pleuritic adhesions are often in advance of the actual deposit of tubercle near the surface; and still more, of course, in advance of its softening."¹ Although the coincidence of inflammatory changes with tubercle was well known, even in the time of Laennec,² and has been from his day till ours the subject of numberless controversies and discussions, it has not been possible until very recently to understand how a tubercular lesion in the lung can, normally, as it were, give rise to non-tubercular adhesions of the pleura by a process of what appears to be simple inflammation, in no way differing from that which takes place in non-tubercular cases, or even in the healing of a wound, or the repair of a fractured bone. We now see (or seem to see) clearly that while the transit of the bacilli of tubercle from the lung to the pleural surface is arrested, or intercepted, in most cases, by the discontinuity of their two lymphatic systems, it is possible, nevertheless, for caseating masses or tubercles near the surface to locally infect the pleura almost as a rule, by the transudation of the secondary products, which, being chemical, and therefore soluble and locally toxic, permeate the tissues immediately surrounding the actual tubercles, and thus give rise to simple inflammations closely associated with the life of the bacilli, but not containing either these organisms themselves, or the tubercles which are their morphological exponents. Under ordinary circumstances the inflammations thus arising do not tend to become acute,—i.e., to end in effusion or suppuration, but only in adhesions. If, however, from any

¹ Clinical Medicine, *et supra*, pp. 397-398.

² See the very interesting article in which the views of Broussais are controverted,—*Les Tubercles sont-ils un produit de l'Inflammation?* Auscult. Médiate, Ed. 2ème, vol. 1. p. 562.

cause adhesions fail to be organized in time to anticipate the advance of caseous necrosis in the lung, then the necrosis, when occurring near the surface, inevitably involves the pleura, and brings with it disasters in the shape of acute inflammatory effusions, or even suppurations, and also of necessity pneumothorax, when the devitalized pleural tissue yields to the pressure outward of the air in inspiration, and especially when cavities have formed in the lung underlying the necrosed pleura. To quote Dr. Coats once more, "It is not uncommon to find quite a number of little dead white areas visible on the surface, indicating

FIG. 2.



A perforation of the pulmonary pleura in phthisis, anticipated by adhesions, as described in the text. There is a large excavation in the upper part of the lung communicating with the surface through a comparatively narrow sinus distinctly seen in the wood-cut. The adhesions have been torn through on removing the lung. From a preparation. (Op. cit., p. 398.)

necrosis of the pleura, perhaps concealed by the fibrin deposited as the result of the acute inflammation" (*loc. cit.*, p. 225). All this is in practical conformity with the views which I expressed in 1862 as the result of observations carried on for years, embracing "a large number of separate facts observed both during life and after death" (*loc. cit.*, p. 395).

In every phthisical lung, therefore, and even in many of the worst and most acute forms of the disease, processes are ever going on both of destruction and of repair. The minor, or adhesive, or (as I have always called them) *conservative* pleuritis belong to the latter class. Both in the acute and advancing cases, and in retrograde, cicatrizing, or fibroid phthisis, they are constantly present, and very often are coextensive with, and limited by, the diseased area of the lung. The absence of these in the course of phthisis would certainly make it a much more speedily fatal disease even than it is, and would in particular make empyema, pneumothorax, and hydro-pneumothorax regular and early incidents, instead of comparatively rare accidents, of the disease. "These little pleuritis (as I wrote in 1862) no doubt contribute largely to the symptomatology of pulmonary phthisis, by causing the well-known 'flying-pains' about the shoulders and armpits, and below the clavicles, which patients occasionally insist on more than the really formidable symptoms of the disease. They are also of no small importance in relation to the physical diagnosis, and are, I believe, often the source of râles, and of irregu-

larities in the respiratory murmur, which are described and commonly thought of only as connected with the tubercular deposit. But by far the greatest importance of these minor pleurisies is in relation to prognosis ; for it is not too much to say that, without them, phthisis could hardly ever pass into the third stage, or perhaps even beyond the first, without destroying life." ("Clinical Medicine," p. 399).

But besides the importance of these adhesive pleurisies in averting and anticipating pneumothorax, I have also to direct your attention before closing to the fact that pleurisy of some kind enters into the only possible reparative process by which a perforation of the lung, having once occurred, can ever be permanently or even temporarily healed. That such cases of absolute healing do occasionally happen is certain. Dr. Thorburn's case, already referred to, is one of them ; and I have recorded another,¹ even more striking and convincing, inasmuch as thoracocentesis had to be performed on two occasions on account of extreme urgency of the symptoms, air being emitted in large quantities on both occasions ; and the recovery taking place thereafter in a few weeks, notwithstanding a very much impaired and very probably phthysical state of the health generally. In this very remarkable, and I will add rare, case there was no doubt at all that the lung which had collapsed underwent a considerable amount of re-expansion, even if not absolutely complete ; and also that no evidence of fluid effusion, much less of empyema, at any time existed. The case which has formed the foundation of these remarks cannot be said to have undergone a healing process in this sense, since the patient is not much, if at all, better off with a large quantity of fluid in his chest than with air ; but still it may be fairly assumed that in the mere fact of the disappearance of the air you have evidence, up to a certain point, of a healing process ; for in most cases of pneumothorax the air does not disappear, and it is to be presumed that the perforation remains open ; indeed, it is usually found so after death. But post-mortem examination also in-

FIG. 3.



Perforation partially sealed up by soft lymph, after the occurrence of pneumothorax. A probe is seen passed through an accidental rupture in the veil of lymph covering the perforation, the margins of which can be distinctly traced by the rough granulations thrown out in their neighborhood. From a preparation. (Op. cit., p. 396.)

¹ Glasgow Medical Journal, 1865, vol. xiii. p 165, case of Janet B., aged forty.

forms us, as is well seen in this preparation, that in not a few cases the aperture of a more or less recent perforation is found, after a time, completely sealed up by fresh fibrin thrown out in connection with a corresponding attack of pleurisy, of which (if it gives rise to effusion) there may also be clinical evidence. And I have myself seen repeatedly, as has also Dr. Coats, instances of pneumothorax in which it was exceedingly probable that one or more previous attacks, of which evidence was afforded either clinically or in the dead body, had been followed by complete sealing up and overlaying of the aperture by fibrin; and which therefore might have ended, even if they did not actually end, in a cure such as took place in Janet B. The process of repair here is exactly the same in kind (though of course differing in its completeness) as that by which perforation is anticipated and prevented through adhesions, as I have already described. It forms, however, part of a much more dangerous type of pleurisy; and there are in general no adhesions possible.

Having all these things in mind, you will not be surprised that I was averse to permitting of any surgical interference last year, in the way of paracentesis and aspiration of the fluid, unless there had been urgency, in the case of Alexander McL. I could not but have it in view that his sealing-up process might have taken place, and that any mechanical strain thrown upon the lung suddenly, especially during inspiration, might easily lead to a renewed perforation. I believe I have actually witnessed an accident of the kind I allude to, in at least one case; but, at all events, it is theoretically probable, nay, almost certain, that in a case of rather recent, or even somewhat advanced, healing, or sealing up, of a perforation by fibrin, the use of the aspirator might undo the whole process, and lead to a return of the pneumothorax. As McL. was not really suffering in any way when he left us in January, 1890, I judged it better, on every account, to let nature have her way, and not to interfere with what might well be her reparative processes, more or less effective. [As, however, the fluid effusion did not tend to disappear, but rather to come to the surface, Dr. Beatson has, since this lecture was delivered, been asked to remove the fluid by free incision and drainage, washing out the cavity with a solution of boric acid. This has been done successfully, and with favorable result up to the present date.]

I conclude with three propositions formulated in 1862, and to which, for reasons stated above, I am still disposed to adhere: "First, that pleuritic adhesions, in the vast majority of cases (of phthisis), anticipate or prevent the occurrence of rupture of the pleura, where

pneumothorax would otherwise be a common or almost certain occurrence ; second, that when adhesions fail to prevent altogether the escape of air, they often limit the space within which it is extravasated ; third, that pleurisy coinciding with, or closely following pneumothorax is not to be viewed as a wholly destructive agency, inasmuch as it tends to the still further limitation of the mischief in many cases, by the rapid sealing up of small perforations, and the formation of new adhesions." ("Clinical Medicine," p. 402.)

A CASE OF ENLARGED LIVER WITH JAUNDICE.

CLINICAL LECTURE DELIVERED AT THE MONTREAL GENERAL HOSPITAL.

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THIS patient, whose case we shall study together to-day, is to many of you no stranger. During the last eighteen months he has on several occasions been the subject of clinical instruction in this hospital.

I need scarcely call your attention to the striking features of the case, which you must perceive at once,—the deep yellow color of the conjunctiva and the skin, the extreme degree of emaciation, and the marked distention of the upper half of the abdomen and lower half of the chest. We shall review his history, discuss the clinical events, and consider the question of diagnosis. From the voluminous notes of his case on record in the hospital books, the following report is condensed :

A. J., aged forty-one, laborer, admitted to the Montreal General Hospital November 28, 1890. He had just recovered from an attack of erysipelas, for which he was under treatment in the infectious ward of the hospital. He had always enjoyed good health up to the commencement of the present illness, and had never been confined to his bed except on one occasion, some twelve years ago, when he was said to have had ague. History of syphilis is entirely denied, though he acknowledges having been very intemperate in the use of spirits when he was younger. Latterly his habits have been steady and regular. The present illness began in July, 1889, when he noticed that the urine became of a dark color, and later the white of the eyes became yellow, but he did not notice any change in the color of the skin until some weeks afterwards. Two months later he began to suffer from pain in the epigastric and right hypochondriac regions, which was of a dull character and was increased by movement and deep inspiration. At this time, too, he began to perceive that the

abdomen was increasing in size, and he suffered from a violent cough, which, when severe, caused vomiting, the ejected matters being of a greenish-yellow tinge. For many years he has been subject to hemorrhoids. During the greater part of last winter he was a patient in my wards in this hospital.

On his first admission, November 19, 1889 (just a year ago), he was weak and emaciated (he said that he had lost thirty-seven pounds in the previous six months) and had intense jaundice of the entire surface. He complained of very severe pain in the right hypochondriac region and the epigastrium. The abdomen was enlarged and tense, particularly above, measuring at its widest part thirty-seven inches. The superficial veins were seen with unusual distinctness through the thin integument, but they were not distended. The liver was enlarged, and measured seven and one-half inches in the right mammary line and seven and three-fourths inches in the right axillary line. Its surface on palpation was quite smooth, and its margins were sharp and well defined. There was no ascites. The spleen was also greatly enlarged. Dulness on percussion extended from the seventh rib to a line two inches below the costal margin in the left axillary line. The areas of hepatic and splenic dulness united in the middle line, so that the upper half of the abdomen was dull on percussion from side to side. Occasionally a small space with tympanitic percussion (stomach?) was found between the splenic and the hepatic dulness. The tongue was coated. The bowels were costive, but the stools were not clay-colored nor were they offensive. The urine contained neither albumen nor sugar, but reacted to the tests for bile-pigment. Pulse 88. Cardiac and respiratory signs negative; no dropsy.

The important question at this time last year was that of diagnosis, and I gave then reasons for believing the patient to be suffering from cancer of the liver. Time has proved that diagnosis wrong, but, inasmuch as it is only by studying our mistakes that we can ever hope to attain accuracy, I shall show you the weak places in the chain of evidence in favor of the existence of cancer of the liver.

From the circumstances of the case, to which allusion will be made later on, the choice rested between cancer or biliary cirrhosis (enlargement of the liver with jaundice), and I decided in favor of the former. These were my reasons:

1st. The enlargement of the liver was great and very rapid. The patient had been ill but four months all told, and during that short time the liver assumed these large proportions.

2d. The liver felt hard and resisting throughout. True, it was

not irregular in outline or nodular ; but we had just held an autopsy on one of my patients in Ward 11 who died of cancer of the liver, in whom the organ was enlarged and uniformly regular in its outline, and no nodules could be detected during life. They were embedded in the surface of the organ, and did not project to a degree sufficient to enable us to feel them through the abdominal wall.

3d. Severe pain in the right hypochondrium was an urgent and early symptom.

4th. Jaundice was early, deep, and persistent. I remember quoting to the class the dictum of Murchison, "The coexistence of enlargement of the liver with persistent jaundice ought always to raise the suspicion of cancer."

5th. The enlargement of the spleen I found difficult to reconcile with my diagnosis, but I got over the difficulty by attributing it to the previous ague. Enlargement of the spleen is rare in connection with cancerous liver. In the case of cancer of the liver already alluded to the spleen was of normal size.

6th. The general symptoms misled me also. The rapidity with which emaciation had set in, and the extent to which it had progressed in the few months of his illness, had a great influence upon my judgment.

The weight of evidence thus adduced out-balanced other considerations : although biliary cirrhosis was well thought over and the alcoholic history taken into consideration, the claims of malignant disease were too potent, and the presumption of biliary cirrhosis was cast aside.

The patient remained in hospital until February 8, 1890, and his condition underwent improvement, though the physical signs remained unchanged. At this time hæmatemesis very frequently occurred, and on several occasions there was severe bleeding from the nose. Pain was constantly complained of, its seat being in the right hypochondrium, so that hypodermic injections of morphine were frequently administered. In January, 1890, a small quantity of blood was from time to time coughed up. There were no physical signs in the lungs. Early in the morning of January 26, 1890, he had a convulsive seizure, the exact nature of which could not be ascertained, followed by rapid rise of temperature, and pain in the left ear. These symptoms were followed by evidence of the onset of erysipelas of the head, and he passed through a most severe attack of that disease, but made a very good recovery, and regained the ground he had lost.

By this time the diagnosis of cancer of the liver was abandoned, as excluded by time. Cancer of the liver does not last long, and a

patient who remains nearly four months in hospital without getting worse cannot be considered the subject of it.

He left the hospital of his own accord. His next stay here was from the 9th of June to the 21st of July last. There was no change in his condition. He measured around the abdomen at the umbilicus thirty-five inches, and the girth of his abdomen at its greatest width was thirty-seven and a half inches.

The region of hepatic dulness began one and a half inches below the right nipple and extended downward seven and a half inches. In the axilla the liver reached as high as the seventh rib, and dulness extended downward nine and a half inches. The lower margin of the liver crossed the abdomen one and three-quarters inches above the umbilicus. Splenic dulness was found anteriorly as far as the nipple-line, while vertically it extended from the seventh rib in the axilla to the crest of the ilium, nine and a half inches.

In the right lumbar region a mass was felt like a continuation of the liver down the right side of the body to the crest of the ilium. It was dull on percussion, and not tender. The heart had undergone some displacement upward: the apex beat at the left nipple. The expansion of the chest was limited to one inch. A few crepitating râles were heard at both bases.

There was no bile found in the urine.

A purpuric rash appeared above the right ankle, which was accompanied with considerable swelling of the leg. This was in the end of June, and after this swelling had subsided he began to complain of a burning pain under the right arm, which was soon followed by the appearance of a crop of small vesicles, which very neatly mapped out the cutaneous distribution of the intercosto-humeral nerve. The left axilla was also attacked, but not so severely.

When he had recovered from this very painful attack of herpes, he began to complain of pain on the inner side of both thighs, and a herpetic eruption made its appearance on the inside of the thighs and the scrotum, mapping out in this case the ilio-inguinal nerve. He was discharged July last.

The physical signs are now—November 28, 1890—practically the same. Since July he has been able to earn his living as a night watchman, but about ten days ago he had a severe attack of erysipelas in the right leg, for which he was admitted to the infectious wards, and on recovery came back to his old quarters in Ward 11. I notice to-day, however, one new symptom,—namely, about the right hypochondrium there is extreme sensitiveness to pressure, which appears to be super-

ficial and is of recent origin. I think it is neuralgic, and a condition analogous to the herpes zoster from which he suffered last summer. In addition to this superficially diffuse pain, which is so severe that it would be cruel to touch the parts more than is absolutely necessary, there is also a deep-seated pain elicited by pressure at the lower margin of hepatic dulness near the nipple-line. This I found on the day of his admission, but, for the reasons stated, I cannot demonstrate it now.



A. J., December, 1890. The lines upon the body indicate the lines of dulness on percussion.

Let us consider now the diagnosis as it stands. The main symptoms are persistent and deep jaundice and enlarged liver.

The causes of enlarged liver are—1, fatty degeneration; 2, cancer; 3, cirrhosis (either syphilitic or alcoholic); 4, abscess; 5, leukæmia; 6, sarcoma; 7, amyloid degeneration; 8, hydatid disease.

The period of time during which the patient has been under our observation enables us to exclude cancer and sarcoma.

Abscess is usually accompanied with enlargement of the liver, with pain, and with jaundice, and the spleen is not infrequently enlarged too, but the constitutional symptoms are those of pyæmia, with rigors, sweats, and high fever, and the course of the disease is very rapid. There is a slower form of hepatic abscess which is met with in those who have lived in the tropics, but our patient has never lived out of Canada. Other symptoms accompany the enlargement of the liver due to leukæmia.

This resembles the fatty liver in size, in the uniformity of the enlargement, and in the absence of ascites; but pain and jaundice are not symptoms of fatty liver, and it is the most painless of all the enlarged livers. Fatty liver, moreover, is usually unaccompanied by constitutional symptoms, and if present they are few, not characteristic, and belong to the other organs affected. The spleen is not enlarged when the liver is fattily degenerated. There is not enough portal obstruction to cause enlargement from vascular engorgement, and the spleen itself does not become fatty.

Is it a hydatid liver? Hydatids are extremely rare in this country, though the Icelandic immigrants in Manitoba are said to be subject to the disease; but it would be unsafe to exclude hydatid disease simply because it is a rare affection. The clinical characters of hydatids are not present in this case. The enlargement is uniform, not irregular. Nor is the spleen enlarged, nor does jaundice occur except as an incidental circumstance. Hydatid tumors usually produce no constitutional symptoms.

Is it a waxy liver? Some of you will remember the remarkable case of waxy liver which I showed to you in Ward 24 a few days ago, and you will remember that the patient had every appearance of good health. You may remember that I pointed out to you that the form of the body of the patient was in no way altered by the enormously enlarged organ it contained. The absence of constitutional symptoms or, in fact, of any symptom at all was remarkable. The woman had never suffered from any digestive disturbance, nor from vomiting of blood, nor from diarrhœa, melæna, piles, ascites, or jaundice, and a distinct cause existed in the presence of a purulent uterine discharge. The characteristics of the liver itself were entirely different from those which we observe in this case. Although its size was enormous, measuring thirteen and a half inches in the right mammary line, pain and tenderness on palpation were entirely absent and the growth of the

organ had been slow and imperceptible. The history of that woman's case illustrates the difference between a waxy liver and the kind of liver we have to deal with in this patient.

We are forced now, by having excluded the other causes of enlargement, to regard this case as one of cirrhosis with permanent enlargement and jaundice. The points in favor of such a diagnosis are—1, age; 2, alcoholic history; 3, early history of digestive disturbance, vomiting, etc.; 4, early symptoms of portal obstruction, gastric catarrh, and hæmatemesis. Hemorrhages from other parts have been constantly occurring,—bleedings from the nose, hæmoptysis, and subcutaneous extravasations,—and these are common in cirrhosis, and are probably due to a deteriorated state of the blood present in that disease. Last year I exhibited before the class a patient with cirrhosis of the liver in whom there were present extensive extravasations of blood on the inner side of the thighs. The diagnosis in that case was verified by autopsy, and there was found also what is not uncommon in connection with cirrhosis, tubercular inflammation of the peritoneum. 5. The enlargement of the spleen greatly favors the diagnosis of cirrhosis. 6. The absence of ascites may be the result of the other escapes of blood, and may be accounted for, too, by the large size of the spleen, which may possibly be a kind of vascular diverticulum for an overloaded portal system. There is a special form of cirrhosis, however, known as "hypertrophic cirrhosis with jaundice," in which the liver remains large throughout. In ordinary cirrhosis, jaundice is either absent or present in a slight degree, while ascites is in almost every case a leading symptom. In this biliary cirrhosis the reverse holds good. Jaundice is persistently present, and ascites is absent, or, if it be present, it does not appear until a very late period of the disease.

I am therefore of opinion that the most reasonable diagnosis we can entertain is that of hypertrophic cirrhosis with jaundice.

Before we leave I would call your attention to a few points of interest.

The occurrence of erysipelas in cases of chronic visceral disease is not uncommon. You remember that he has had two attacks of the disease since he came under our notice. Patients suffering from affections of the liver and kidney are specially liable to erysipelas. Last winter we had in the hospital a medical student who was the subject of acute Bright's disease complicated with an attack of erysipelas of the face, and one of the cases of chronic Bright's disease which I demonstrated to the class last winter dated from an attack of erysipelas. The occurrence of herpes in connection with jaundice has

been noticed by medical writers. In jaundice other skin-affections as well as herpes are not at all uncommon, notably urticaria, and most jaundiced patients complain of itchiness of the skin. The herpes in this case is interesting for two reasons: first, on account of the nerve-areas which it occupied,—namely, the intercosto-humeral and the ilio-inguinal,—and, secondly, on account of its affecting both sides of the chest, which is very uncommon.

URÆMIC CONVULSIONS; EPILEPSY; DYSPHAGIA, DUE PERHAPS TO THE PRESSURE OF A STRAY THYROID GLAND.

TWO CLINICAL LECTURES DELIVERED AT THE MASSACHUSETTS GENERAL HOSPITAL.

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Massachusetts General Hospital, etc.**

URÆMIC CONVULSIONS.

CASE I.—I will begin without the patient, gentlemen, as he is not so important as what happened to him. He is a boy of seventeen, a barber, born in Italy; in America nine years. He was recommended to the house from the Out-Patient Department, entering on November 13, when the following history was obtained:

He used alcohol in considerable excess until three weeks ago; beginning early, you see. Had the clap three months ago. General health always good. About two weeks before entrance he got his feet wet. The next morning he awoke with headache, puffiness of the face and the eyelids. Since that time he has been unable to work, complaining of nausea; and he noticed that his urine looked "like red wine," but he has not noticed the amount passed, either an increase or a diminution. On the third day his abdomen, legs, and ankles were somewhat swollen. He had some vomiting, and latterly pain in the muscles of the right leg; none in the back,—please note that; no pain in the back. Bowels were moved with cathartics. There was no disturbance of vision.

Such a history as that would naturally lead you to examine the urine. The examination of the urine at entrance is recorded: smoky, acid, specific gravity 1010, albumin rather more than one-eighth per cent.; sediment considerable, brownish in color with much blood and pus, many renal cells, some of which are brown granular and fatty; casts hyaline, fine, coarse, and brown granular in abundance, some epi-

thelial casts with blood adherent. Urea 6.88,—call it seven grains to the ounce.

He had but very slight œdema at the time of entrance. The apex of the heart is in the fifth space just inside the mammillary line. The area of cardiac dulness is moderately enlarged. At the apex and into the axilla, and heard distinctly over the whole cardiac area, a loud systolic souffle, replacing the first sound, is heard, with accentuation of the second pulmonic sound. He passed thirty-two ounces of urine in the first eighteen hours after entrance. He entered Thursday, the 13th. I saw him first on Friday, the 14th, under the following circumstances: During the early part of the night he was restless and complained of severe headache, for which he was given ten grains of phenacetin, after which he slept most of the night. The next morning he was given a dose of salts to move his bowels, but vomited them. He complained of some headache. At 10.30 A.M. he complained of inability to see distinctly. At 11 A.M. he had a convulsion, with pupils moderately contracted, some cyanosis, frothing at the mouth, and general clonic muscular spasms lasting about three minutes, with a copious involuntary discharge of urine. His bedclothes were pretty thoroughly wetted. Between 1.30 and 3 P.M. he had nine convulsions lasting from one-half a minute to three minutes, each diminishing in severity. Between the convulsions he was either comatose or semi-comatose, and did not know what he was about. That afternoon he recognized his father and some of the members of his family.

Here is a sample of the urine passed yesterday. You see a smoky urine with a moderate sediment. It may have been shaken up somewhat in bringing it down here. You see the sediment in the lower part of the glass. That is a urine in which you would expect to find blood. It is intimately admixed and some of the blood pigment is set free. That is not the urine suggestive of hemorrhage from the lower urinary passages, or from the urethra; it is a urine the appearance of which is suggestive of hemorrhage of renal origin. Here is the albumin. I should call it pretty nearly one-fourth per cent. at present. The zone is not very thick, but is perfectly opaque as you look at it from above.

So here we have a case entering as one of acute nephritis, the diagnosis perfectly clear. The only question which could come up is whether this is really an acute nephritis or an acute exacerbation of a chronic affair; that is, whether there had been something going on for a long time of which this was a fresh lighting up. In determining that question you will take into consideration the previous history of

the patient so far as it can be obtained, his physical condition in general, the condition of his heart, especially the left ventricle, the tension of his arteries, and the character of his urine. There is nothing in his history to indicate that this was an exacerbation of a chronic affection. Apparently, the whole thing dated from two or three weeks before in the slight exposure from wetting his feet. The evidence to be derived from the heart is equivocal, because we find the evidence of a valvular lesion. There is a certain amount of enlargement with a systolic souffle at the apex transmitted into the axilla, and an accentuated pulmonic second sound. This mitral lesion is, in all probability, not to be referred to the kidney-trouble. In an older person, with a history of previous attacks, or the suggestion of more or less long-standing trouble in the kidney, the cardiac might be attributable to the renal condition. In this case it is probably independent, and it seems likely that the patient once had an endocarditis which has run its course and left a regurgitation through the mitral orifice. The most frequent cause, of course, of endocarditis is rheumatism, especially in young subjects. We have no history of rheumatism whatever in this case. The tension of the pulse is low. The character of his urine, on the other hand, is in some respects more indicative of an acute exacerbation of a chronic affection than of an entirely fresh attack. The low specific gravity of the urine, the relatively small amount of albumin it contains, and its quantity are all significant. To determine whether an acute nephritis or one which is chronic with an acute exacerbation is present, we must await subsequent developments. The convulsive attacks, however, are clearly uræmic in origin.

(The patient brought in on a bed during these remarks.)

I said there was no high tension in the pulse. As confirmatory evidence of the absence of high tension, we have the lack of aortic accentuation. The pulmonic second is louder than the aortic, but then, of course, we have, in this case, a reason for the accentuation of the pulmonic second in the mitral regurgitation.

Now, here we have a rather typical case of uræmic convulsions. Please note the symptoms,—those of an acute nephritis attended by very little dropsy. Look at him now: no dropsy, and none was noticeable when I saw him first on Friday morning. The flow of urine was apparently sufficient,—thirty-two ounces in the first eighteen hours, with seven grains of urea to the ounce, over two hundred grains of urea in that eighteen hours. In this case we had premonitory symptoms, although they were short, and not very well defined. We had some headache the night before. That morning we had some vomit-

ing, but it followed the ingestion of the concentrated salt solution, which sometimes causes vomiting in a person who is not uræmic. To some stomachs it is rather obnoxious. Then there was a little headache and indistinct vision, and very suddenly on came these successive, fully-developed convulsions, with coma in between. Muscular twitchings were not noted, so far as I know. Those muscular twitchings are premonitory symptoms of uræmia in many cases, and will suggest the danger of convulsions coming on. They are to be regarded as a warning that you may have to deal with this severe nervous explosion. He complained of indistinct vision, and afterwards lost his sight altogether,—uræmic amaurosis. A very interesting thing about this blindness of the uræmic state is that it is entirely unassociated with any changes in the retina. The results of ophthalmoscopic examination are negative; and very frequently the response of the pupil to light is maintained, which shows that the trouble must be above the corpora quadrigemina, and is to be referred to the ophthalmic centres in the occipital lobes. It is one of the effects of the uræmic poison upon the higher nervous centres of vision, and is generally transitory. The vision is restored as the toxic agent ceases to manifest its effects. The pupils in this case were moderately contracted during the time of the convulsions and the coma, not dilated. His temperature was normal at the time of entrance. On the morning of the 14th, which was the day of the convulsion, it was subnormal, under 98° F. That evening, after all these convulsive attacks, it reached nearly 104° F., dropping the next morning, the 15th, to 99.5° F; the next morning, the 16th, to the normal point, where it has practically remained. You will see how the pulse rose with the temperature that evening, the 14th, to 125, and the respiration was also rapid.

Now, in this case there is no difficulty whatever in the diagnosis either of the nephritis, or of the nature of the convulsions and the coma. We had to do clearly with uræmic convulsions and coma. But there are cases in which the diagnosis is extremely difficult, and it may be impossible for a time to determine their exact nature.

Let us take the convulsions. Convulsions of uræmia are spoken of as epileptiform. They are exactly similar to those of true epilepsy, but are of different origin. You may see your patient first in the convulsions or in the coma. You may not be able to get any history whatever, and you must make a diagnosis then as well as you can from these phenomena alone. Now the convulsions, I repeat, in themselves offer no distinctive points from those of epilepsy, and you have got to consider, especially in these cases where you see the convulsions,

epilepsy and hysteria,—those two affections in particular. If you can obtain from the friends a history of previous epilepsy, much light will, of course, be thrown on the case.

The epileptic paroxysm seldom has much premonition. You don't have such warnings as we had in this case of convulsion. The epileptic fit sometimes comes on with absolute suddenness, but sometimes it comes on preceded by an aura, so-called, which aura may start from one point or from another, is generally of brief duration, only a matter of a few seconds or minutes. The epileptic convulsion is frequently single and followed by sleep, and there is usually complete unconsciousness, but the epileptic paroxysms may follow one another in rapid succession, the patient not emerging into clear consciousness in between. If you can obtain no history and you see the patient for the first time in the convulsions, unless there is œdema, and unless you can get a sample of the urine, it may be impossible to make your diagnosis, especially if one epileptic convulsion succeeds another, if you have a condition more or less well-marked of the status epilepticus, so-called.

Hysterical convulsions will befall in the great majority of cases the female sex. You will not have œdema. You will not have elevation of temperature. The pupil generally responds to light, and during the convulsion the movements are more wild in character. There is apt to be crying out, not simply before the convulsion as in the case of the true epileptic paroxysm. There is the cri-epileptique which immediately precedes the fit, just one cry, but there may be a good deal of crying out in hysterical convulsion. The tongue is seldom bitten in the hysterical convulsion. The patient throws herself about a great deal, cries out, may attempt to bite herself or those in her neighborhood. Of course an examination of the urine, if it can be obtained, will settle the question. Moreover, in the hysterical convulsion the sphincters are not relaxed. You don't get the involuntary passage of urine or of fæces as you may get, and not very infrequently, with an epileptic or a true epileptiform convulsion. So much for the convulsions.

You may see your patient for the first time comatose. Then other things must be considered. In the case of coma you must think of the coma which follows an epileptic convulsion. You must think of the coma of narcotic poisoning, especially of opium and alcohol. Also the coma of sunstroke, of apoplexy, of meningitis, of trauma.

In alcoholic coma you have complete and absolute muscular relaxa-

tion, you have generally a flushed countenance, you have a strong smell of alcohol about the individual and his breath. Of course a person suffering from coma of any other variety may have taken a drink of whiskey before his attack. It is to be borne in mind, that one moderate drink does not produce drunkenness ordinarily.

In opium-poisoning you have the contracted pupil and the slow respiration. In both opium and alcoholic coma you have no modification of temperature.

With sunstroke you may have deep coma, flushed face, stertorous respiration, etc., but the temperature will settle the question,—105°, 106°, 107°, 108° F.

The distinction between uræmic coma and apoplectic coma may be impossible. In a young individual the chances are against apoplexy. The apoplectic attacks of young individuals, when they occur, are generally due to embolism, and the coma which may follow them is generally not prolonged. But the apoplexy of older individuals is frequently from hemorrhage. Then you must remember that in chronic Bright's disease apoplexy not infrequently occurs, especially in the chronic interstitial form. In this affection you have degenerated arteries under high tension, conditions which favor the occurrence of hemorrhage. The distinction may be very difficult between these two. The great Addison of Guy's Hospital thought that in the character of the respiration a distinction could be drawn: that there is a higher pitched respiration in uræmic coma than in the coma of apoplexy. I do not think we can attach a great deal of importance nowadays to that distinction. In apoplexy ordinarily the temperature will be moderate.

In meningitis, again, we have an inflammatory affection, and you will find a modification of temperature generally, and you may get the previous history of severe pain in the head, photophobia, and will very likely find the head retracted, etc.

The hysterical coma is not so deep. Under strong stimulus the patient can be roused. Again, there is no loss of control over the sphincters in hysterical coma, and the reaction of the pupils is maintained; and if you can get the history, it is likely to be that of a neurotic individual, and there is likely to be some cause for this hysterical attack. Something has happened which has produced emotional disturbance.

Epileptic coma, unless you can get an examination of the urine, may be very difficult to distinguish. It may be possible to get enough urine to test for albumin by wringing out the clothes in cases where it is important to make the diagnosis.

In trauma you will have the history or the marks of the injury. The patient has fallen down and struck on his head or something of that kind, and that will generally determine the question.

There are one or two points in this case to which I wish to call your special attention. It was known that an acute process was going on in the kidneys before the appearance of the convulsions, which were preceded by signs of danger, though these were not very marked. When, therefore, the convulsions came, there was no question as to their origin; but a very important practical point, which I would like you to lay to heart, is this, that the attack came on when the kidneys were apparently doing sufficient work,—thirty-two ounces of urine containing seven grains of urea to the ounce in the first eighteen hours of his stay in the hospital. Dropsy also was very slight. Now, an acute uræmic attack is quite as likely to occur in the absence as in the presence of notable dropsy, the dropsical fluid containing urea in considerable amount and holding it outside of the circulation stored in the cellular tissue or in the internal cavities, whence it may exert little direct influence on the nervous centres.

How are we to explain the advent of a nerve-storm like this, where the excretion of urea appears to be sufficient? A great many mistakes have been made in the diagnosis of these conditions from the reliance on the fact that the flow of urine has been apparently sufficiently free; that therefore the attack could not be uræmic. In these cases undoubtedly the flow of urine has been deficient. You will find, as your experience accumulates, that people's ideas about the amount of water which they pass is rather vague. If they pass water frequently, they are apt to think they pass much; and if they pass it infrequently, they are apt to think they pass little; and you can attach no value ordinarily to the estimate of the individual as to how much urine he passes unless an accurate measurement is made. If a patient should secrete urea at the rate of four hundred grains a day, but does excrete only three hundred and fifty, an accumulation of fifty grains per diem is going on, the effects of which accumulation must sooner or later tell upon the nervous system. This indicates to you how important it is to note the specific gravity as well as the daily quantity of urine. The latter may be sufficient while the solid constituents are diminished, and in the event of either a small quantity or a low specific gravity a quantitative estimation of urea is desirable.

This patient, for instance, was passing, perhaps, a fair amount of water; but the specific gravity was low, urea was accumulating in him, and then came this sudden explosion.

The question as to what is the toxic agent in uræmia has been much discussed, and a good deal of criticism has been made as to its being urea. Frerichs thought it was carbonate of ammonia. That view is not held now. Experiments on animals threw doubt on the theory that it was urea, because it was found that large amounts of urea could be fed to animals without producing any trouble, but you must remember that those animals had healthy kidneys. As soon as liquids were withheld, the explosion came. As long as they had sufficient fluid to dissolve that urea, with their healthy kidneys they could pass it out with sufficient rapidity. But limit the amount of fluid, and accumulation took place. Whether it is urea, or whether it is a combination of toxic agents, we don't know. The latter seems perhaps the more probable. The experiments of Landois, who has applied the various urinary derivatives to the naked brains of animals, indicate that kreatin and kreatinin play a much more important rôle than urea in the production of convulsions. But it is interesting to contrast this state of affairs in regular uræmic poisoning with, for instance, the condition of affairs when both ureters become pretty suddenly blocked, when the urine cannot get out of the system, but the kidneys themselves are healthy. Of course, such cases must be rare. The blocking of one ureter is not uncommon, but the nearly simultaneous blocking of two must be quite rare, especially from within. Pressure can be exercised on both ureters from the growth of a cancerous tumor or something of that kind, but in those cases generally the occlusion is not sudden, as it were. The pressure has been gradual, and there has been distention behind, hydronephrosis, etc. Still there are some of those cases on record, and in them the patients seemed perfectly well for several days. There is no urine thrown out of the system. None of the excrementitious constituents of the urine are thrown out by the urinary passages. There is no vomiting, no diarrhoea, no discomfort. These people feel well for a week, and do not generally die before the eleventh day, and then the death is not accompanied by convulsions, simply slight twitchings generally; and the heart gradually fails,—no such state of things as we got here. There the kidneys are healthy relatively. In the case of Bright's disease they are not; and it seems as if the free circulation of blood through the kidney had something to do with the cause in some way or other which we don't understand,—modified the toxic principles in a way that they are not modified when the kidneys are diseased, and the circulation is not free. There is an interesting thing about the effect of urea—I say urea simply to designate the toxic principle—upon the nervous centres.

You note, as exemplified in this case, that on the higher centres, the intellectual centres, the centres of consciousness, and on the centres of special sense, it has a paralyzing effect. You have coma, loss of consciousness, either indistinct vision or loss of vision from the effect on the occipital lobes, the higher ophthalmic centres; but when you come to some of the lower functions of the nervous system, those which preside over muscular action, for instance, instead of getting paralysis, you get the evidences of irritation, you get convulsion. That is a very interesting thing and well to remember, showing the different manifestations of the poison upon different kinds of nervous centres. Deafness sometimes comes on from the effect upon the auditory centre in the same way that the uræmic blindness comes on.

You will note that on the 14th, the day of the convulsion, a little more than five ounces of urine that we know about was passed. He had a passage of six or eight ounces, I should judge, that day involuntarily. The next day fifteen ounces; yesterday sixty-four ounces of urine passed, of which this is a sample. The specific gravity is 1009; rather low, but the quantity of urine is considerable. The temperature, pulse, and respiration have all come down to the normal point.

Prognosis.—I think the prognosis is good in this case, as far as recovery from this particular attack goes, at all events. If his kidney trouble is acute, he is likely to recover entirely; if a chronic underlies the acute process, recovery will, of course, be only partial.

With regard to the prognosis of uræmic convulsions in general, it is ordinarily better in an acute case in a young subject whose other organs and tissues are more likely to be in relatively good condition than in the case of a person past middle life with perhaps a chronic interstitial nephritis and the more or less wide-spread changes which accompany or follow that affection.

Treatment.—In the first place, what was done for this individual? The first thing was to give him one-fourth grain of pilocarpine. Then the hot-air bath was rigged up as rapidly as possible; that is, the cradle, and tin-funnel going under the bedclothes. A stove-pipe will answer. That can be got in many houses. Rig up a funnel somehow, get a lamp under it, and conduct hot air under the bedclothes raised over a cradle, the clothes tucked in around the neck.

In fifteen minutes the skin had not begun to act much, nor had the salivary glands started up, those being the two organs especially affected by pilocarpine; so he had another one-fourth grain, and soon began to perspire freely. Perhaps I had better read the record:

"Pilocarpine, one-fourth grain, repeated in fifteen minutes. Hot-air bath. Profuse perspiration in one-half hour."

Then we tried to move his bowels; you will remember that the salts given early in the morning were vomited. I gave him one-thirtieth of a grain of elaterin under the skin, wishing to see whether that would work. That was given and repeated without effect. Then he was given two drops of croton oil on the tongue, and the same dose afterwards repeated. He was unconscious. You must get the drugs in from some other avenue than the stomach. It was just put on the tongue, and we got free movements after a time from it. During the last convulsions his pulse got rather feeble, perhaps partly under the influence of the prolonged hot-air bath, partly under the influence of the pilocarpine, which has a certain depressing effect upon the heart's action, and here we have a damaged heart you remember. The pulse got rather weak, and he was given some hypodermics of digitalis and brandy, and during the last convulsion a little ether. He had no convulsions after three o'clock. He was a little stupid and drowsy the next day, but, as you see, he is now all right.

Now, in cases of uræmia, if uræmia is due to the accumulation of these toxic principles, of course the clear indication is to get rid of them, and under these circumstances, as I just said,—I am speaking of acute uræmia,—you are precluded giving things by the stomach. You have two main avenues of vicarious elimination of urea,—the skin and the intestinal tract. For the skin you have got pilocarpine, which you can give hypodermically and in the way in which we did,—one-fourth of a grain, and repeat in fifteen to twenty minutes if the effect of the first dose is not pronounced, remembering the danger of the effect of the drug on the heart, which may require stimulation later. You must watch the pulse. You must not run off and leave the patient. The action of the pilocarpine can be promoted by the use of the hot-air bath, as I just described to you. If nothing of that kind is at hand, you can use the hot wet pack. You can sponge the patient with hot water and wrap him up in a sheet wrung out in hot water, and wrap him up further in blankets, and that will set the skin acting very freely in a short time. The action of the hot wet pack is promoted by giving hot drinks, but that, of course, you could not do under these circumstances.

The best thing to give for the bowels is croton oil. It produces watery discharges. There is a drain of serum into the intestinal tract, and it carries with it urea. That is the best thing, because it can be given on the tongue, and will be absorbed from there. Croton oil is

an active vesicant when applied to the skin. It does not seem to produce as much effect on the mucous membranes as on the skin, and it makes very little difference if the patient does have a blister or two on his tongue in comparison with his possibly having his life saved. You will see that in this case the convulsions lasted from 11.30 A.M. to 3 P.M., although he was sweating profusely. For the convulsions themselves ether can be used; and the ether has its application perhaps especially if the pulse is weak, being a very good cardiac stimulant.

Now, during this attack I listened to his lungs carefully, and found there was no evidence of any œdema. There was no dulness, and the air entered freely. His face was not much flushed. His pulse was rapid, but not bounding or of high tension. I took those things into consideration, because I thought a little of bleeding him, but it seemed to me that the indications for venesection were not present. Bleeding is a valuable remedy in some cases of acute uræmia, attended by coma and convulsions. I say of acute uræmia. Its application is much wider in those than in the chronic cases. In the chronic cases the patient can less well spare the loss of that amount of blood. If the case is chronic they have that much less, you may say, to recover on. In drawing the blood you take off a certain amount of urea at the same time in the blood, and may diminish the extra work which is thrown upon a laboring heart. For instance, some four or five years ago, on coming to the hospital one morning, I found a tremendously strapping 'longshoreman comatose; no smell of alcohol about him; his face turgid; the radial artery, like a clothes-line almost, big and tense, incompressible; stertorous respiration; albumin in his urine. I bled him immediately to the extent of a quart without its having very much effect upon his pulse. Perhaps I ought to have taken more. He had that venesection in addition to pilocarpine, the hot-air bath, and croton oil. The man got well, and we found later that this was a second attack. He had been in the hospital a year before with symptoms of less gravity. Before this second attack came on he had been loading paving-stones from a scow into a boat, standing in water up to the arm-pits all day, and drinking pretty freely. So much for the treatment of this condition.

What are we doing for the patient now? We feed him on milk and keep his bowels open. He has had some jalap powder since he has been able to swallow, and cream-of-tartar water to drink. You heard him say he was hungry, but that hunger is not to be indulged too quickly. It is better to keep this fellow on an exclusive milk diet, and keep him warm in bed for some days yet, at all events, before

any addition is made to his regimen. You shall see him again before he goes.

Here is a specimen of the sediment under the microscope. In the field of vision there are uric-acid crystals, some extraneous matter, and a very beautiful epithelial cast.

[The subsequent history of this patient would lead one to think that the above attack was really an acute exacerbation of a chronic and latent nephritis.]

EPILEPSY.

CASE II.—I want to show this patient for a few minutes simply in connection with the other. He was a medical accident, so-called. He was found in a fit and brought to the accident-room, where in the course of an hour and three-quarters he had twenty or thirty convulsions lasting from thirty to sixty seconds each. They came on suddenly, and were so violent that it took three men to restrain him. The head was thrown about, pupils dilated, eyes suffused, face red, covered with perspiration, marked spasm of the masseters and grinding of the teeth, and frothing at the mouth. Between the convulsions the patient was able to talk sensibly, stating that he had been accustomed to such attacks for eight years, and wanted to be held so that he would not hurt himself. He was sent to the ward. These attacks have repeated themselves almost daily since he has been in the hospital. The attacks are of an epileptic nature. Consciousness is lost during the attacks. I brought him down to give you the contrast between the two cases, the common feature of which is convulsion, but in this case the urine is all right and physical examination is negative. His attack is preceded by an aura, a visceral aura. He says it feels as though his stomach were "full of pain." A visceral aura like this belongs rather to the rarities. The aura is much more likely to start from an extremity, I think, than in this way. The ordinary treatment of epilepsy has met with ill success in this case,—namely, the treatment by bromides. I have given him bromides in large doses. I have given him borax, but the paroxysms are not restrained thereby, and his stomach seems to be upset. The tongue is coated and he vomits. The lack of success with those treatments, the condition of his stomach, and the fact that his aura is visceral, have determined me to see what I can do by treating his stomach. It is true that the aura seems to start in the umbilical rather than the gastric region; still these attacks being sometimes preceded, sometimes followed, by vomiting, by evidence of derangement of the stomach, I am going to have that organ washed out every morning, and in order that the tube may not be bitten off or

anything of that kind,—I don't think there is much danger of it, anyway,—I shall have a cork jammed between the back teeth, so that, if a convulsion should come on while the tube is in, the necessity of work for the surgeons later will be obviated; and if he stays here I will let you see him again. He has got a coated tongue, and I am inclined to think that this is a case in which we must treat the stomach in order to treat the patient. He says he has once bitten his tongue during an attack, but I don't see any scars.

November 19, 1890.—The boy whom I showed with uræmic convulsions last Monday is doing remarkably well. He is passing, I think, over seventy ounces of water in the twenty-four hours. He is quite cross because he is not allowed to have a more generous diet.

You will remember the patient whom I showed with epilepsy and whose history I read briefly. I told you it seemed to me in that case the indication was to treat the stomach. We had tried bromides and borax ineffectually. His tongue was heavily coated, and his stomach was in a poor condition. The aura in his case seemed to be a visceral aura, and I told you that I should wash out the stomach and treat him in that way. I told Dr. Bates to wash the stomach out that day before dinner. He reported to me yesterday morning that it had been impossible to accomplish it. I tried it myself yesterday, and met with no better success than Dr. Bates. The man held his breath as the sound got down towards the stomach, became stiff all over, and began to halloo, get his arms up, seize the tube, and pull it out; so I told him he might go, and he left the hospital. His mind has failed somewhat during these repeated and prolonged attacks. Mental failure does not necessarily follow, but is quite apt to ensue in cases of severe epilepsy. The man undertook to say that he could not help what he did; that he had to pull the tube out, which is not true. The trouble was he would hold his breath. There was no use in keeping him in the hospital any longer. He is rather a subject for the almshouse.

DYSPHAGIA.

CASE III.—Here is a patient whose history is imperfect, but still is important in some respects. He was born in Poland, is a shoemaker by occupation, thirty-five years of age, married, and came here first on the 8th of November complaining of a burning sensation in the lower part of the neck. You observe that when I ask him to put his finger on the place where the burning sensation is, he puts his hand all about, so that it does not seem to be very clearly defined. He com-

plains also of difficulty in swallowing. There is a slight hoarseness. That is about the history.

Difficulty in swallowing,—dysphagia,—as I understand, has been the prominent symptom in this man. What does that indicate? It indicates to us the possibility of some affection either within or without the œsophagus. Within the œsophagus it indicates stricture; either cicatricial or cancerous, or simple spasm. There we have the three commonest causes of dysphagia from within the œsophagus. Then we may have pressure from without either from aneurism, abscess, enlarged glands, or some other form of mediastinal tumor, as cancer. We might add specific growth.

Now, the determination of true stricture of the œsophagus must depend chiefly upon the use of the sound; but it is not desirable to use the sound in cases in which the trouble is not from a true stricture of the œsophagus, but from pressure outside due to an aneurism. As aortic aneurism is not an uncommon disease, before passing your sound it is wiser to examine and see whether you have to deal with an aneurism or not, so that we will begin with the physical examination.

As we look at this man there is nothing very striking about his appearance. He is not cyanotic. He certainly has no notable dyspnoea. You notice that he has a certain distressed look about his face, and just now as he swallowed I noticed that he contorted his countenance as if it hurt him. Whether that is genuine or not I do not know. Whether that is constant remains to be seen. As we look at his neck and chest we notice in the former a swelling just to the right of the median line, somewhat oblique in situation. There is no distention of the veins of the neck. The pupils are equal, and respond to light. The radials seem to be equal, and beat synchronously. The respiration is easy. There is no stridor, you notice. As you look at the upper portion of the chest, you see that there is a slight relative fulness to the right of the upper portion of the sternum. That may or may not be significant. There is no pulsation to be seen over the upper portion of the chest. The cardiac apex is not to be distinctly localized by the eye alone. There is a slight diffuse shock over the cardiac region. I can feel indistinctly the apex in the fifth space, and percussion seems to correspond. There is a distinct systolic murmur heard at the apex, not transmitted outward, heard indistinctly also as far as the pulmonic orifice, but decidedly louder in the mitral area, without pulmonic accentuation.

We will now examine this swelling in the neck. When he swallows you can see it rise up and become decidedly more prominent.

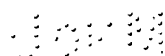
You see it more distinctly when he sits than when he lies. You see a rounded bunch which comes up, is attached to the trachea, and lies in behind the sterno-mastoid. It is not tender; it is somewhat elastic, smooth, not nodulated, not very hard, and clearly attached to the trachea. I do not think the trachea runs off to the left. The thyroid cartilage does not seem to be absolutely in the median line, but the trachea lies more deeply, and it is a little difficult to say whether it is pressed over to the left or not. The probability is very strong that this thing in the neck is an enlarged and displaced thyroid gland. It does not feel like a lymph-gland, nor like one of those lympho-sarcomatous tumors. It feels like the thyroid and it is attached to the trachea. Percussion over the lungs themselves is negative in front. Now, we want to determine whether there is any change of resonance in the region of the prominence to the right of the sternum. We note no marked pulsation there. I can feel indistinctly a pulsation which is not general over the whole prominence but limited to the second interspace on the right side, and is very slight; there is no heave whatever. At that point the pitch on percussion certainly rises, and he seems to be quite tender. There is more tenderness on pressure over the left than over the right side. There is no notable tenderness in the cardiac region. There is vesicular respiration throughout both sides in front of equal intensity without any adventitious sounds in the lungs at all. The heart-sounds are audible over the upper sternal region, but not nearly so loud as they are down over the cardiac region. There is no murmur to be heard over the upper sternal region, and there is no shock which is communicated to the ear. There is nothing remarkable about the respiratory murmur over the back. On auscultating the œsophagus while he swallows, nothing remarkable is heard. There is no delay in the radial pulse. His urine is negative. There are no enlarged glands of any kind. There is no venereal history. On examining the penis no scars appear. The meatus is small. We noticed that the voice sounded a little hoarse. Laryngoscopic examination was negative, showing simply a little catarrh. His blood has also been examined and is negative.

Now, what have we got? As regards symptoms, we have ill-defined pain, discomfort, burning sensation, with some difficulty in swallowing. As regards physical examination, we have this tumor in the neck which rises and falls with the trachea in swallowing, and we have a certain slight dulness over the upper sternal region, especially to the right, combined with the prominence of a similar area. We have a slight systolic souffle at the apex of the heart without any evidence of cardiac

enlargement. His temperature is normal. There seems to be tenderness over this prominence, but it is not very well localized, and I do not feel very sure of it. People of this race are difficult patients. In a way they get "rattled," have very little moral stamina. If they get sick they go to pieces, and make a good deal of complaint of pain, much more than Anglo-Saxons. They have apparently less fortitude.

Now let us consider the question of pressure, granting for the moment that his dysphagia is due to pressure. So far as specific disease goes, we have no evidence pointing in that direction. The man has no cachexia. He has not lost any flesh in particular. His general condition is good. It does not seem likely that we have to deal with a cancer. Of course, it is possible, for cachexia is comparatively a late symptom, and is an evidence of the generalization of the effects of the cancer; but it does not seem likely that we have to do with it, taking into consideration his age, general appearance, and symptoms. We have no enlarged lymphatic glands. The tumor in the neck is the right lobe of the thyroid, or a detached piece of the thyroid, occupying a lower position than usual. With regard to abscess, we might have a mediastinal abscess starting from a gland or caries of the bone, or what you will, and that, of course, may give rise to dulness on percussion, and to pressure signs. We have no history of chills and no rise of temperature, which would speak against, although they do not absolutely negative, the supposition of abscess. You can have a cold abscess which gives rise to neither fever nor chills. The prominent and dull area does not seem quite as tender as one would expect an abscess to be, but that is not necessary. I do not think that abscess can be positively thrown out in this case. There may be a mediastinal abscess here which is exerting pressure.

In regard to aneurism: In the first place, the signs of aneurism are of double nature, the direct signs and the indirect signs, the direct being the pulsating tumor, the pulsation of which is as forcible as that of the heart and is synchronous with it. An aneurismal tumor is dull on percussion, often with a single or double murmur, often with a thrill, though murmur and thrill are not necessary. The expansile pulsation is the most striking sign. The only one of all these signs which is present here is a certain amount of dulness on percussion, and that dulness is well above the seat of the aorta. The most frequent seat of aortic aneurism is the ascending portion of the arch, and we are more apt to get the tumor lower down than to get such an area of dulness as we did here. The indirect symptoms are the pressure symptoms, and the pressure may be on venous trunks preventing the



proper return of blood from the head. There is nothing of that kind here now. Dr. Gannett tells me when he first saw the man his face was rather suffused, and I believe that there was some prominence of the veins in the neck, as if there was some impediment to the return of blood from the head. The pressure may be on the sympathetic, giving rise to inequality of the pupils,—absent in this case; or pressure on the left recurrent laryngeal, paralyzing the corresponding vocal cord,—absent; pressure on a primary bronchus, cutting off or weakening the respiratory murmur on one side, and perhaps causing stridor,—absent in this case; pressure on the œsophagus, interfering with deglutition,—there is the only evidence of any pressure that we have. It seems to me that, taking all those things into consideration, we can say that aneurism is very improbable. Moreover, the man's history and occupation are against aneurism. In aneurism, you know, the special causative agents are strain, syphilis, and alcohol. His occupation, that of shoemaker, is not one which involves any strain. We have no evidence whatever of any previous syphilis, and he does not look like a man who has been an abuser of alcohol. Now, there is no venous distention when you put him on the back under favorable conditions for developing it, so that the only pressure symptom that we have is this interference with swallowing, and therefore it seems to me extremely improbable that we have to do with aneurism.

Now, with reference to the true strictures of the œsophagus: The cicatricial stricture comes practically only after the ingestion of strong acids or strong alkalis. He has not drunk any of these things. Syphilis, for lack of evidence, we can leave out of consideration. With reference to cancer and spasm, the former would seem to be improbable, but we cannot be sure of it. To decide the question of spasm we will in a moment pass the œsophageal sound. The physical signs certainly warrant us in passing the bougie in this case, while we have not sufficient evidence of aneurism to deter us from doing so. This large bougie, you see, goes down with perfect ease, and encounters no resistance whatever. In taking it out it sticks a little behind the thyroid, or on the cricoid. In meeting with resistance at this point you must be careful not to think you have to do with stricture, because there is always a little resistance there. It is evident that we have not to do with any true stricture in this case, and at present there is no spasm. There is one other possibility which has been suggested by Dr. Gannett,—namely, that we may have to do here with a supplementary thyroid gland, not in the usual seat. We know that pieces of the thyroid gland are not infrequently congenitally detached, and may or may not remain

latent. They may be the seat of new growths afterwards. They may be the seat of hypertrophy, and these little bits of thyroid which have been detached in this way are found anywhere from the thyroid cartilage to the aortic arch ; perhaps little bits, the size of a pea, perhaps larger. The true thyroid in the neck of this patient is not perfectly normal, and it seems possible that there may be a stray piece of the thyroid lying behind the sternum which has increased in size, and which by exerting pressure will explain the discomfort and burning sensation complained of and also the difficulty in swallowing.

Prognosis.—In this case the prognosis depends much on whether the tumor keeps on growing or not. I don't think we can be too positive about our diagnosis in this case. I don't think we can throw out the possibility of either abscess or aneurism. They are unlikely, and aneurism the more unlikely of the two. If this is an abscess it will probably not be absorbed. It will keep on growing, and it may point in such a situation that it can be opened and drained. If this is an aneurism it will increase and give rise in time to more distinct symptoms than are present now. If it is a stray thyroid enlarged, it may remain stationary or it may keep on growing. If it remains stationary, he may get on very well and grow accustomed to his discomforts ; but if it continues to grow, it will be liable to add materially to the discomforts from which he suffers, and to exert pressure in other directions ; but its seat is such that it is not very capable of operative interference.

You cannot treat it locally by injections behind the sternum, and it is not a very nice place from which to extirpate the tumor.

Treatment.—Medicinal treatment in any event would seem to promise very little for this man. It will do very little for an abscess. It will do very little to retard the growth of an aneurism, certainly apart from rest. It will have no effect at all as far as we know upon a thyroid growth. It is better to give the man something to satisfy his mind, a consideration which is perhaps more important in an individual of this race than in a man who has more fortitude.

We will keep him under observation, if possible, and await further developments.

Surgery.

MODERN METHODS IN SURGICAL OPERATIONS.

CLINICAL LECTURE DELIVERED AT THE JEFFERSON MEDICAL COLLEGE HOSPITAL.

BY W. W. KEEN, A.M., M.D.,

Professor of the Principles of Surgery in the Jefferson Medical College.

GENTLEMEN,—In beginning my clinics I desire to describe to you in a few words the antiseptic method which I shall carry out before you.

You will notice, first, that all our instruments are sterilized. This can be done in several ways. Here in the clinic I use the Schimmelbusch sterilizer. There are three trays, in each of which are placed the instruments for each operation. They are boiled in a one-per-cent. solution of carbonate of soda for fifteen minutes. You know already, from your bacteriological studies, that all micro-organisms, and even their spores, are killed by prolonged boiling. The object of the soda is to prevent the rusting of the instruments. In operations in private houses, of course we cannot use the sterilizer, on account of its size and the consequent inability to carry it from place to place. Accordingly, in private operations I sterilize my instruments in this fashion. The moment my assistant reaches the house he puts the needed instruments in a tray containing a one to twenty carbolic solution, and there they lie during the fifteen or twenty minutes necessary to make my preparations.¹ As soon as I am ready to begin the operation I pour off the carbolic solution and replace it with boiling water. This keeps the instruments perfectly aseptic and also clean, and avoids at the same time the disagreeable effects of the carbolic acid on the hands.

Next, as to the hands and person of the surgeon, the most important point is that of the finger-nails. These are first cleansed with great care with soap and water and a nail-brush. Then the nails

¹ To be sure that nothing is omitted or forgotten, I have prepared an "operation blank," furnished in pads of fifty. (See American Journal of the Medical Sciences, January, 1891.)

are carefully cleaned by a knife, and after soaking the hands for a minute in absolute alcohol they are washed and scrubbed in a one to one thousand bichloride solution, or, roughly speaking, one of seven and a half grains to a pint. The most convenient way for making the solution is to carry a bottleful of these compressed tablets, each of which contains the necessary quantity of sublimate for a pint of water. If you desire a one to two thousand solution, each tablet is dissolved in a quart. Remember also that not only the hands but the entire forearms must be cleansed in the same way. More than this, the clothing of the surgeon ought to be sterilized, so that if his hands touch his coat, or if, in leaning over, his coat touch the wound, it shall not carry infection with it. This white duck coat which I wear over my clothing was dipped in a bichloride solution yesterday afternoon and dried but not ironed. In private practice, again, my procedure varies a little. It is troublesome to carry these coats around and to have them washed at home, and I therefore have three sheets, one each for myself and my two assistants, dipped by the nurse in the same bichloride solution the night before and rough-dried. These are folded to the proper length and width, the upper end turned in next my person and tied around the neck by a bandage, while another bandage holds it at the waist. (See Fig. 1.)



Next, the person of the patient must be properly prepared. The day before the operation the field of operation and a wide area around it is scrubbed with soap-and-water, then cleansed with ether to remove the fatty matter, then with a one to one thousand bichloride solution, and if the patient's person is unusually soiled, or in places of unusual infection, such as about the feet or between the toes, we use a one to five

hundred solution. If the abdomen is to be opened, the navel must be carefully disinfected by some absorbent cotton wound on a match and dipped in the sublimate solution. After this a bichloride dressing is applied over a very wide area,—not only the immediate field of operation but also a large area around it. At the operation the field of operation is surrounded either with sheets or towels which have been similarly dipped and rough-dried. I like the dry towels much better than the wet ones which you will very frequently see used. I think them quite as efficient, and at the same time they do not wet either the clothing or the person of the patient. The object of the dry towels rather than the wet ones is also more than merely for cleanliness. Wet towels get cool very soon, and may, as I have known in more than one instance, give the patient an attack of rheumatism, and they are apt to chill the patient and therefore produce considerable shock. The arms or legs of the patient are likewise surrounded with dry sterilized towels, and in all operations above the shoulders I am careful to see that the ether inhaler is surrounded by a similar towel and that one is pinned around the hair, a precaution which is especially important in women.

Except in special operations, particularly in the abdomen, I have abolished sponges altogether, and use pledgets of gauze, either sterilized by heat in the Arnold or Sattegest sterilizer, or, more commonly, the ordinary bichloride gauze. In the abdomen, however, I always use sponges, as I do not wish to leave behind any ravelled threads unobserved. I pack the gauze pledgets in each nook and corner of the wound as I leave one part of it and proceed to another, following Landerer's dry method; for, if the field of operation has been made absolutely sterile, the raw surface of the wound will not become infected, and hence there is no need for the abundant flushing which some time ago was the rule. The gauze sponges also by pressure check the hemorrhage from the smaller vessels, and so the loss of blood is very much less. Of course, in tubercular or suppurating cavities flushing is very essential. Getting rid of sponges, I am convinced, is getting rid of one of the greatest dangers of infection, for the gauze is thrown away as soon as used.

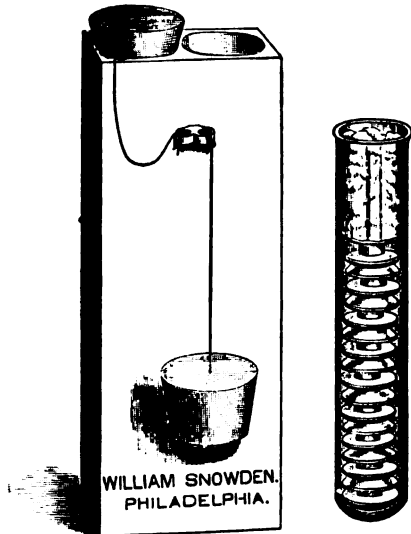
The silk that I use—the very fine thread for ligating arteries and for buried sutures, and the thicker thread for sutures through the skin and underlying parts—I sterilize by heat, after the method of Prof. Halsted, of Johns Hopkins Hospital, as follows: In an aseptic test-tube I put a small pledget of cotton at the bottom, then fill the test-tube with spools of glass wound with silk, then stop up the mouth of the tube with cotton and put it in the Arnold sterilizer and heat it for

an hour. These small spools (also Professor Halsted's), you will observe, are more like cuff-buttons than the ordinary long spools. Each carries only two or three yards of silk, and I think this is a decided improvement over the larger spools, inasmuch as each spool of silk is quickly used up and there is none left to be soiled and put away with possible septic infection. To carry them safely I have devised the following method: I have here, as you see, a block of wood an inch longer than the test-tubes. Two cavities are excavated by an auger of such a diameter as to carry the tubes, which are retained safely in the wood by means of a rubber cork. (See Fig. 2.) Thus I can carry my test-tubes around in my operating-bag without danger of breaking. The catgut I use has first been sterilized by heat, then soaked in a sublimate solution, and then kept in absolute alcohol.

Of course all my assistants have been as careful in sterilizing their hands and clothing as I myself. I am very strenuous as to their being just as careful antiseptic surgeons as I am, but as I cannot have my eyes everywhere at the same moment, and, moreover, as all of us are sometimes forgetful, I am going to set you as watch-dogs upon both myself and my assistants, and if you see them or me make any mistake in the antiseptic technique, I shall never deem it improper if you will write to me and inform me of it. We have but one thing in view in this room, and that is to do the very best surgery in the very best way.

In dressing my cases after operation, except in suppurating or tubercular cases, I never use iodoform. Its odor is to me excessively repulsive, and I find, practically, I get as good results without it as with it. Its antiseptic properties have been disproved by numerous experiments. In tubercular cases, however, its value is unquestionable, and in them I use it freely. The dressings I use are either of gauze, first made hygroscopic and then dipped in a one to one thousand sublimate solution, or the Hartmann wood-wool dressing which Dr. Coplin,

FIG. 2.



my bacteriological assistant, has carefully tested and finds entirely sterile. The dressing is then covered by a sheet of disinfected rubber dam to prevent the wound fluids from soaking through at any one point. The whole dressing is then held in place by sublimate gauze bandages, and, if need be, by a common muslin bandage or a binder over all.

What about drainage? you will naturally ask. That depends on circumstances. In small wounds, well dried and without the prospect of much oozing afterwards, I provide for no drainage. But in large wounds I still use it in the following manner. Before closing the wound and applying the dressing I lay in the wound a fenestrated rubber tube, and alongside of it a small bundle of horse-hairs. Each of these protrudes from each end of the wound for an inch, and if there is any danger of their slipping in I stitch them to the skin by a silk suture. The dressing should be massed somewhat about these points of exit so as to absorb the wound fluids.

If no drainage has been used, I usually dress the wound on the fourth or fifth day, when I remove half of the sutures, and again on the eighth day, when the rest of the sutures can be removed and the wound should be well without a drop of pus. If I have used the "combined tubular and capillary drainage," I redress at the end of twenty-four to forty-eight hours, according to the size of the wound and the amount of discharge, and remove the rubber tube. On the fourth or fifth day I remove the horse-hairs and treat the wound as already described.

If the wound has been an infected and suppurating one, before operation I am extremely careful to disinfect it with extra care by repeated scrubbing, sponging, and flushing, and one may employ sublimate solutions of one to five hundred or carbolic acid, even pure to suppurating bone or sinuses, or in solutions of one to five or one to ten, followed by iodoform.

Following these methods, I invite your careful observation of the results I get, as a rule, in a clean wound without loss of tissue. I expect to show you all the cases operated on healed at the end of a week, and then and there to remove the few remaining sutures and send the patients home when they have sufficiently recovered their strength. In some cases there may be a delay of a very few days, but if the case is not well in ten days, or any suppuration follows (in clean wounds), I shall always suspect some mistake on my part or on that of my assistants. Modern surgery demands this result, and we should be satisfied with nothing less.

ULCERS.

CLINICAL LECTURE DELIVERED AT THE BOSTON CITY HOSPITAL.

BY D. W. CHEEVER, M.D.,

Professor of Surgery in the Harvard Medical School.

GENTLEMEN,—This patient, fifty-five years of age, has varicose veins, which fact probably explains the reason of the ulceration which you see upon his leg. The short saphenous vein is the one affected in this case. The anterior or long saphenous is not, but the short saphenous vein is very much dilated. The ulcer is placed just on the edge of the shin. It is of four years' duration and has undergone a great many changes. All this dark tissue has not necessarily been ulcerated, but is pigment which has resulted from varicosity and inflammation. A portion of the ulcer is healed, but the bottom of the ulcer, at one point, is sloughy and indolent. It shows no signs of repair whatever, and is tied down to the fascia and bone.

The surest way to cure this ulcer, if the patient could do it, would be to put the leg in a horizontal position, when it would soon heal under the simplest treatment. It is a mistaken idea that when we have so much pigmentation it means specific trouble. The change takes place in this way. The vein gets loaded with blood, the valves cease to act, thickening takes place, pigment is thrown out, and finally the skin becomes cedematous, and the epidermis is easily rubbed off. Now, a slight abrasion scrapes off this thin epidermis, and ulceration speedily follows. What would be a bruise in a healthy tissue quickly makes an ulcer in one of these varicose spots, and after the ulcer comes it is hard to heal.

This ulcer ought to be treated with stimulating applications. The application ought not to go on the tender skin at all, for if it should the latter will break down. Tincture of myrrh and water, equal parts, would be a good application. If painful, a soda-and-opium wash should be used. This is composed of one part of laudanum, two of liquor

sodæ chlorinatæ, and ten of water. Wet a pledget of lint and keep it wet all the time, not allowing it to dry, and cover the sore with it. You must not put on any water-proof material, as it spoils the action of the remedy. If you put on oiled tissue or silk, you convert this into a hot poultice, which makes the tissues break down faster than ever. A cloth must be laid on, and wet and renewed from time to time, night and day. Besides that, you must look out that the irritating fluid does not trickle upon the thin skin and produce an eczema. To prevent this, some kind of greasy material is used, as, for instance, castor oil, oxide-of-zinc ointment, or mutton tallow. Castor oil is unirritating to burns, sores, etc., is thick, clean, and holds its place well. The benzoated oxide-of-zinc ointment is the best application. In this case a bandage should be worn, to keep the veins emptied. This is a case where the elastic stocking will not do, as there would be sweating through the thin skin. The best way is to use the thin flannel bandage, cut bias so that it will stretch, eight yards long. Put it on every day, and take it off at night. The flannel is better than cotton because it sticks, and it is not really any more irritating.

CASE II.—This man, now sixty-eight years old, fell into a lime-barrel twenty years ago. Since then his skin has always been thin, and he has had several ulcers, slow in healing. Of course all ulcers will get well twice as fast if the patient will go to bed. In bed they will get well under any treatment. Most of these people, however, are unable to go to bed, and are obliged to continue their occupations. This is a typical case. Here are the varicose veins upon the inner surface of the foot, and the venous radicles, so called,—*i.e.*, those that take their origin from the capillary system,—are filled with venous congestion. Wherever you see the dark points there are clots formed where the veins have become plugged. That change is secondary to the valves above having become incompetent.

In this case, again, we have the short saphena very much enlarged. The long saphena is not at all involved. This man has had a long series of ulcers, and there are some that are hardly healed; and you see now very marked pigmentation, even beyond the line where there have been ulcers. This pigmented skin is very thin, very inelastic, fastened to the tibia and to the fascia, and has been going through these changes for a good many years. The varicosity here has obstructed the circulation, the skin has been filled with effusion, the pigment is thrown out, the surface of the epidermis has been almost floated off with the fluids, slight bruises have made repeated ulcers, and when they heal it is with very thin cicatricial tissues.

It is in a leg like this that we often see a chronic eczema. Here is a pocket of venous blood, tender, and the chief agent in perpetuating that ulcer,—a large venous pocket which obstructs its circulation. Now, if this ulcer did not heal, a sure and immediate way to cure it, if desirable, would be to tie that vein. I do not think it is very desirable to tie veins, and do not often do it. In this case soothing applications are indicated. I should say that the best thing for this was the soda-and-opium wash, which is cleansing and soothing, and an abundant application of some salve or grease that would keep the fluid from spreading. In addition we should apply a bandage over the ulcer to empty the veins. If he can lie in bed, of course a bandage will be unnecessary; and he would be better off without it. When these sores become very indolent, and you cannot make them heal in any other way, they will heal under the internal administration of opium, which has a great power to heal sores. Two or three grains of opium a day, to which the patient can gradually become accustomed, will heal almost any sore, under proper care. It stops all pain, and it stimulates immensely the capillary circulation, for it is well known that the circulation of the skin is stimulated under its administration. Obstinate ulcers are more promptly healed when treated by opium internally than in any other way.

CASE III.—This man, aged fifty years, has a well-marked chronic eczema. Behind the ankle there is a place where the epidermis has peeled off as the result of this disease. There is one ulcer, partly healed. The main one is a good example of the ulcer that is firmly tied down by old inflammation. You cannot move it. The bottom is good enough, and it is trying to granulate rapidly. You notice that the edge on the outside is very thick and high and does not heal at all. The other edge looks better. The trouble is, it cannot come together, as it is held by the firmness of the tissues. In some of these cases,—I don't know that I would advise it in this case on account of the eczema,—the treatment that is recommended by Mr. Gay, of London, is surely curative. This method consists in freeing the edges of the ulcer, so that they can come together, by making two parallel incisions, one on each side, down to the fascia, until the tissues are entirely free. The next day these incisions gape and make spaces on each side of the old ulcer, which goes on to healing with great rapidity. Generally the three wounds heal within a fortnight or three weeks. This treatment is extremely effectual, but we cannot use it here, on account of the eczematous condition of the skin. It seems to me that the first thing that this case needs is a poultice, followed by external

treatment with cod-liver oil, which is one of the best things for eczema. Then begin to cut off the edge either with a caustic or a knife, and give it a chance to granulate and heal. Use no stimulating applications at all. We would describe this as a chronic indolent ulcer, with pigmentation and eczema.

CASE IV.—This man shows the whole leg thick and hard, with cedema of ankles and chronic eczema. He has a sore in the typical place, not painful, although it looks so. It could hardly be called an indolent ulcer, for it is making an effort to repair. Meanwhile, it is obstructed by the adherent skin. If the patient could lie by for a few days, a poultice with flaxseed and charcoal, two to one, would take off all this decayed epidermis, would soften down the redness, and cause it to assume a different color. Then you could do something towards healing it. This ulcer would be benefited by the treatment proposed by Mr. Gay. You see how firmly and inseparably it is attached. The varicose veins are general and not marked in any place, and you can feel frequent thrombi that are in the pockets of the vein. The cedema of the foot is considerable. The objection to tying the veins in these cases is that the internal system of veins going through the muscles speedily becomes enlarged, and the trouble is as bad as ever, though out of sight.

CASE V.—This boy comes to us with an ulcer over the elbow. It is plain enough to see why this does not heal,—it is on the elbow. It is a simple ulcer, and a splint would heal it. It will heal under any application if kept still. This has all the appearance of a specific ulcer, and as he has a specific history we will employ the mixed treatment of the iodide of potassium and the biniodide of mercury freely, putting the arm on a splint at an obtuse angle. Put on any simple application, and the ulcer will heal. The ulceration over the ulna is very characteristic. This is a favorite seat for specific ulcers. No medicine will heal the ulcer on the elbow until you hold the elbow still.

CASE VI.—This boy, fifteen years old, takes bromide for epilepsy. He has a bromide eruption over the body. He scalded his ankle, and applied a salve to it. Now, there are salves and salves. Some are advertised to heal, and frequently do not; some are not advertised, and do. Fatty matters easily decompose, and a rancid salve contains fatty acids, which are irritating. They can be prepared with the salicylates or carbolic acid, or with benzoin, which prevents this change. The benzoated oxide-of-zinc ointment is a simple means of treatment, and does not decompose. The cold creams and salves decompose readily from the heat of the skin, and develop fatty acids, which irritate a sore.

That is a little point which is worth remembering. Castor oil would be a good application for this, and under it the sores would get well.

We have not seen an irritable ulcer this morning. They are excessively painful. They are not varicose ulcers, but are due to some nerve-fibre being exposed in the ulcer, and giving rise to the pain. The cure is simple, straightforward. It is to divide the cutaneous nerves above the ulcer. Score the tissues subcutaneously all around ; the pain ceases, and the ulcer heals as by magic.

CASE VII.—I could not, perhaps, find a better specimen of the old varicose leg with enormous pigmentation and chronic tied-down ulcer than the one in this elderly man. The ulcer is tied down to the fascia and it is impossible for it to heal, because the sides cannot creep together. There is infiltration of all the venous radicles down to the capillaries. There is great oedema of all the tissues of the leg. The first stage of the treatment should be rest in bed, with poultice a few days to soften down the edges ; then Gay's incision, about three and a half inches long, down to the fascia ; then continued poulticing of the entire part, with applications of soda-and-opium wash, and it will heal. It is a perfect example of the pigmentation which used to be thought specific, but is purely local.

In the case of an irritable ulcer, divide all the nerves in the upper arc, between the fascia and skin. The ulcer will take on a healing process the next morning. In this case much help can be gotten by bandaging. The leg is a sponge of dilated, partially-obstructed veins, going down to the minutest point.

I don't know any more instructive lecture you can have than this. It deals with a matter that you have all got to treat. Ulcers will bother you to death, because they last so long. If you can control the patient for a few weeks, properly-applied treatment is inevitably successful, and all these ulcers can be healed if you can have your way. Almost all of them will be healed if the patient will take a horizontal position and remain still. Of course I except the specific ulcer, which wants other treatment. It is extraordinary how the specific element shows itself after years.

Now, a good many of these people with varicose veins are benefited by elastic stockings, but the stockings won't do where there are ulcers, because they sweat the surrounding tissues so much that they break down and increase the ulcer. This is sometimes true of the rubber bandage, which is more harsh than the stocking. You put on the elastic stocking and get an even grip ; but when you put on the rubber bandage, each turn becomes tighter and tighter, and where it laps over

it is very tight, and is a very powerful application. It will not do on legs where there are ulcers.

Our treatment, then, will be myrrh wash, soda-and-opium wash, glycerin salves that will not decompose, nitric-acid wash (one drachm of fuming nitric acid to a pint of water) as a stimulant, and the internal administration of opium. These are the measures most likely to cure ulcers. In out-patient departments and dispensaries you see a great many of these patients, who have to be treated while walking about and getting their living. You will see in watching these departments how much can be accomplished even in patients who are walking about. One of the best treatments is strapping. Some use a piece of tin or sheet lead, which is strapped over the ulcer, and prevents all friction or abrasion of the surface. That and bandaging, with cleanliness, does very well with many of these ulcers. Given a varicose leg, an abrasion having occurred, an ulcer having formed, there is an insuperable tendency to its reforming. The way to treat it is to bandage it from the beginning. Then it can be held in check. If not held in check, it goes on until it becomes a positive source of lameness and infirmity

ON A CASE OF INJURY OF THE HEAD.

CLINICAL LECTURE DELIVERED AT THE MIDDLESEX HOSPITAL.

BY J. W. HULKE, F.R.C.S., F.R.S.,

Senior Surgeon to the Middlesex Hospital; Consulting Surgeon to the Royal
London Ophthalmic Hospital.

GENTLEMEN,—When I last met you here, before Christmas, the subjects of the lecture were two cases of injury of the head, each very severe of its kind, and illustrating a different form of injury. One, you may recollect, was a case of very extensive incised wounds of the scalp caused by a person striking his head through a pane of window-glass. These cuts occasioned very severe hemorrhage, the pinna of the right ear was almost completely severed from the side of the head, and there was the complication of the lodgement of a large piece of glass, two and a half to three inches long and about three-fourths of an inch wide, beneath the scalp in the temporal region. That patient's recovery was somewhat retarded by an attack of erysipelas just when he appeared to be almost well. Fortunately for him, the erysipelas was strictly cutaneous, was not severe, and ran its usual course; he made a good recovery and has since left the hospital.

The other case, you will remember, was one of much greater severity. It was an instance of compound, comminuted, depressed fracture of the skull (its vault), deeply denting a long, boat-shaped, sagittally-directed channel in the parietal bone, placed about a third nearer to its upper than its lower border, and complicated with the entanglement of pieces of the lining of the man's cap between the fragments. This injury was treated by trephining, and the man has been apparently well for a long time. I say *apparently* designedly, because there remain two small sinuses, and through one of these can be felt a small area of bare bone, therefore, presumably, of dead bone, and until this has exfoliated and cicatrization is complete we cannot pronounce him to be perfectly well.

The case that I bring under your notice to-day is another instance

of head injury. The first, you remember, was one of extensive scalp-wounds; the second, one of severe depressed fracture of the skull, and the case now before us is one illustrating a third form of injury, concussion of the skull. This case is one of extreme interest. The daily notes taken by the dresser would form a report too long and wearisome for reading here, and I shall therefore place before you a full abstract from his case-book.

On October 11, 1890, C. P., twenty-six years old, was admitted into Bird Ward for the effects of an injury of the head, alleged to have been occasioned fourteen days previously by the patient striking her cheek with the handle of a saucepan. (You observe I use the word "alleged.") Below the right eye, involving the lower eyelid and the malar region, were traces of a fading ecchymosis, and here, and in the adjoining right temporal region, the subcutaneous tissues were oedematously puffy, occasioning obvious swelling most prominent just over the zygoma and ceasing below the curved line limiting the temporal fossa superiorly. Quite distinct from this swelling was a second, prominent, obviously fluctuating swelling over the right parietal bone, the limits of which, though not accurately definable, seemed not to transgress the area of this bone. This swelling was not particularly tender, nor very painful, nor was the scalp over it hotter than elsewhere, nor was it discolored. The patient had a very anæmic appearance, suggestive of broken health, of privations, and of work beyond her strength. Her statement that until the time of the accident she had always enjoyed excellent health was discredited by the fact that not one of her children (four in number) had survived its infancy. She had much headache, a furred tongue, and her temperature was 103° F.

With the exception of an interval of one week at home, she has continued in the hospital up to the present time, and throughout this period (several weeks) her temperature has remained high. It has not again reached 103° F., but it has a few times exceeded 102° F., very frequently passed above 101° F., and commonly oscillated about 100° F., and on one occasion only was it found to have fallen to the normal line, 98.4° F. Headache has been constant, variable in degree and in seat,—now chiefly frontal, then occipital, and often general.

On November 10, a slight inequality of the pupils was observed, the right appearing to be slightly larger than the left, and at this time a tender, puffy swelling of the scalp behind the left mastoid process was noticed. On November 11, the right forehead was puffy. On November 13, there was increased swelling of the right temple, an elastic puffiness without great tenderness, no heat, no redness of in-

tegument. Headache very severe. On November 17 the right cheek was swollen and an alveolar abscess connected with carious roots of the right upper molar teeth was detected and opened, giving escape to about two drachms of very fetid pus. This occasioned no further trouble, and soon closed under local treatment. In the early part of December a puffy swelling appeared behind the right mastoid region, resembling that on the left side, which continued without obvious change, and a chain of slightly-swollen and tender lymph-glands was discovered along the posterior border of the right sterno-mastoid muscle. At this time the fluctuating swelling over the right parietal bone, and the ecchymosis of the right cheek had quite disappeared. Her condition continued the same, with little notable change, until the 22d of December, except that the puffy swellings in both temples had become perceptibly larger. Scared by the apprehension of an operation that had been spoken of in her presence, she now went home.

On December 30 she sought readmission, finding herself quite unable to discharge her domestic duties. On the 1st of January—that is, of the present month—this note was taken of her condition: “Face pale, waxy, its integument smooth, shiny, devoid of wrinkles, puffed. Right temporal fossa, in its lower part just above the zygoma, distinctly prominent, the prominence fading out insensibly upward but traceable nearly to the temporal ridge. The integument here cannot be pinched up in a fold, but it and the underlying fatty tissue are soft, and both of these are readily movable upon the deep temporal fascia. The contractions of the temporal muscle when the teeth are tightly clinched are scarcely perceptible to the finger-tip placed upon the muscle. They appear to be hampered by the presence of a deep swelling firmer than the superficial puffiness. She cannot separate her jaws widely, owing apparently to a loss of extensibility of the temporal muscles. The left temporal fossa is occupied by a similar but rather less prominent swelling. The posterior margin of the left mastoid process, with the immediately adjoining occipital region, and the posterior border of the right sterno-mastoid muscle present similar swellings, and the enlarged lymph-glands, already mentioned, along the posterior border of the muscle persist. No trace of the former parietal swelling remains, except, perhaps, at the right limb of the lambdoid suture. There is palsy of all muscles of the right side of the face. Deafness (absolute?) of the right ear is present,—a watch-tick and a tuning-fork were not heard even when they touched the side of the head. The meatus externus is clear. A small defect is apparent at the lower and front part of the membrana tympani, where there is

a minute bunch of granulations, but no discharge. Temperature is 100.2° F., and pulse 102."

On January 4 she complained to the ward sister that she saw two or three things where she knew there should be only one. On investigating this symptom next day diplopia was found, limited to the left half of the visual field, with increasing horizontal separation of the images towards the left, and obliquely vertical separation of them increasing upward. Her intelligence is not great, and her statements as to the relative positions of the two images sometimes seemed contradictory. No absolute loss of range of mobility of the left eye, tested separately, was discernible, but in the consensual upward movements, and in looking towards the left, the left eye seemed to lag a trifle behind the right eye.

On January 5 some deafness of the left ear was present, the watch-tick being inaudible beyond nine inches. This deafness increased rapidly, to such an extent that on the 11th she failed to recognize words unless spoken very loudly and close to her ear. On the 12th instant she said her double sight had gone, and this was verified to-day. Notwithstanding the deafness of her left ear, there has recently occurred a distinct though slight improvement in the patient's condition. She now sleeps well, her headaches are less, her diplopia is gone, but her extreme deafness has somewhat depressed her mind.

Now, I am afraid, gentlemen, I may have wearied you somewhat with this long narrative, and yet I could not shorten it without risk of omitting some fact of importance towards interpreting the case. Briefly summed, we have, first of all, a blow or "blows." I say "or blows" because you must always take a patient's statement in respect of an injury with a certain amount of hesitation. It is difficult to understand how a blow upon her cheek, the spot where she said that she had been struck, where we saw the ecchymosis, could have produced a hæmatoma upon the parietal bone, and it is quite possible that instead of receiving a single blow, and a self-inflicted one, she may have been in some scuffle and got several blows.

You had a good illustration of intentional misrepresentation of an injury last week. A child was admitted into the Bird Ward with a wound of the eyeball, said to have been inflicted by her putting her head suddenly down, striking her eye against the knife of a little brother who was eating his dinner by her side. It came out a few days later that the wound was caused by the brother throwing a knife at the sister, a totally different circumstance. We might recall indefinitely instances of this sort.

Here, at all events, there was a blow or blows, and those blows caused contusions, the evidence of which we had in the ecchymosis and in the hæmatoma. These contusions were followed by superficial, puffy swelling in the right temple, later in the left temple, then by other similar swellings on the right forehead and in both post-mastoid regions. These overlies deeper swellings, which are fixed and firmer than the superficial ones. Then much headache, very considerable fever, then palsy of all the right side of the face, then diplopia referable to the left eye, then deafness of the left ear, and to-day there are palsy of the left side of the face and absolute deafness of the left ear.

What is the explanation? Those of you who, not knowing anything about the case, went into the ward and simply looked at the woman's face as she lies in bed, might recognize in her appearance some resemblance, perhaps not very great, to that of a person whose face is puffed and swollen from renal dropsy, for her face has a similarly puffy, waxy, and smooth appearance; but in renal dropsy the eyelids very quickly swell. Here, however, the eyelids of the left eye (the side opposite to the seat of the blow) are quite unswollen. Besides this, we find, on an examination of the urine, that this is perfectly devoid of albumin, and its specific gravity and reactions are normal. There is therefore no ground whatever for suspecting that she is laboring under renal disease.

Then, again, some of you perhaps would find that the appearance of her face is like that of a person with myxœdema. In myxœdema there is a not very distinct, clear, puffed state of the face, a similar dull, heavy, unintelligent expression to that which this woman presents; but the moment you place your hand upon any of the œdematous parts you find at once that the cutaneous and subcutaneous œdema is soft, and in this respect it is quite different from the hard, firm œdema characteristic of myxœdema. Besides, there are none of the other symptoms of this latter affection. Obviously, therefore, the resemblance here is merely superficial.

We turn, then, to the cranial swellings. These and the fever, obviously the result of the injuries, are the local and general expressions of an inflammatory process. The swellings, you will remember, are composed of two parts, a superficial œdema, soft, and a deep, firmer, fixed part. Now, this firmer fixed part is manifestly a periosteal node, and the overlying œdema is something with which you must be familiar in instances of localized periostitis in other parts of the body. I suppose all those of you who have frequented the out-patient

room must have seen, and perhaps some of you who may have carious teeth have experienced, how frequently in cases of alveolar periostitis large, collateral, fluxionary œdema appears in the cheek. This is not an accompaniment present only in suppurative, localized periostitis.

In these days foot-ball-players furnish frequent examples of periostitis resulting from severe kicks upon the shins, causing a node overlaid by superficial œdema, which, if the person is perfectly sound in health, usually disappear wholly, or leave merely a little thickening of the bone. It is where the person is previously broken in health and the injury is neglected that suppuration more often follows, or that the inflammation is not localized to the seat of original injury, but overruns a considerable tract of the bone, extending sometimes very widely.

There is one very remarkable point in this case,—the symmetry of the cranial swellings in both temporal fossæ and in both post-mastoid regions. This symmetrical disposition, this symmetrical allocation of the periostitis, speaks strongly in favor of the presence here of a constitutional taint. Such symmetry is exemplified in many constitutional diseases. For instance, in psoriasis, how commonly nearly identical patches occur on both elbows, or on both hands; and similar instances of symmetrical distribution could be indefinitely multiplied. The symmetry in this case is then very suggestive that we have to do here with a constitutional or predisposing factor. The blows were the exciting factor, but co-operating with this, and which but for these injuries might have remained dormant, is a constitutional taint.

What, then, are the common constitutional disorders in which periostitis most often occurs? Excluding instances of acute diffuse periostitis rapidly inducing wide-spread death of the bone, what are the common causes of the more chronic forms of periostitis frequently termed plastic? They are syphilis and rheumatism. Have we any evidence in this case of the presence of either of these affections? With regard to rheumatism, there is the negation of any rheumatic antecedents, but it must be mentioned that on one occasion in November she complained for a few days of pains and a little stiffness of her right shoulder-joint. I did not think much of that: she was lying not far from the door, through which there was occasionally a strong draught blowing. The shoulder was rubbed with an embrocation, and after two or three days the pain and stiffness entirely disappeared. Next, what evidence is there of syphilis? Not any is found in her directly personal history. No scars are discoverable in her throat; there are no marks of former ulceration of the fauces, or of the pharynx

or tongue. Nor are any vestiges of syphilis discoverable on any part of her body. There is, however, one very strong point in her family history,—every one of her children died in infancy; this excites the suspicion that she may have a dormant syphilitic taint. I think also that the history of her present illness—the progress of the disorder—rather favors the idea, and the result of treatment is confirmatory of it.

Let us go back for a few moments and analyze the palsies. The inability to widely separate her jaws was not attributed to palsy of the mandibular depressors, but to the loss of extensibility of the temporal muscles, which were stiffened by infiltration with inflammatory products, an alteration present also in the right sterno-cleido-mastoideus, particularly in its upper part, where it contains more or less tendinous tissue. What explanation can be given of the right facial palsy? Note that this was complete, involving all the muscles of this side of her face; it did not pick out some branches of the facial nerve, leaving others intact. Facial palsy is, you know, a common accompaniment of hemiplegia. When, therefore, it occurred in this case, the question arose whether it was due to a central cause or was of peripheral origin. Facial palsy, associated with hemiplegia, is very usually incomplete. The mouth only may be affected, and some muscles of expression will often escape. Facial palsy in hemiplegia being then usually partial in degree and distribution, the inference from the implication of all the branches of the right portio dura favor a peripheral more than a central origin. The right ear also was deaf. There were traces of perforation of the membrana tympani. There seems then, in the presence of a sufficient cause, considerable probability that the facial palsy on this, the right side, was due to an extension of inflammation from the tympanum, implicating the facial nerve as it traverses the aqueductus Fallopii, which forms a slight linear projection upon the inner wall of this space. With this evidence of an antecedent otitis media, the probability that the palsy of the right facial nerve was of peripheral and not of central origin was increased. A few days afterwards diplopia occurred. What was the significance of this? First bear in mind that diplopia does not necessarily imply a palsy of any of the ocular muscles, neither does every disability of an ocular muscle necessarily mean that it is palsied. So the innervation of a muscle may be perfect, yet the muscle will not be able to work if heavily overloaded; thus the levator palpebræ will be powerless to raise the eyelid when this is much swollen.

Any of you can in a moment induce diplopia by pressing with

your finger-tip upon one of your eyeballs, so as to slightly displace it from its true position in the orbit. If, while doing this, you look at a finger held at a few inches distance before your eyes, you will see two fingers appear where only one is present. Make this experiment, and then move the finger at which you are looking through a small space from side to side, to your right and left, and, provided always the pressure remains the same in direction and in degree, you will see that the two images of the finger, the false and the true, preserve almost exactly the same distance between one another and the same relative direction. This is of interest for us to note. Displacement of one of the eyes from any mechanical cause may, then, induce diplopia.

Not long since there was a patient in the hospital with a tumor rather rapidly intruding into the orbit and displacing one eye (some of you may recollect her in No. 4 bed in Bird Ward); she had no ocular palsy whatever, but had marked diplopia. Where, however, diplopia depends upon palsy, the images do not preserve the same relative distance, but as the object travels further in the direction in which the eye should be moved by the palsied muscle, the distance between the images will be found to increase. This patient had no diplopia in the right half of the visual field, but the moment the object passed to the left of the middle line diplopia began, and when we moved the object outward farther towards her left, the separation of the images increased from a couple of inches to a quarter of a yard.

Now, a diplopia of this form depends upon ocular palsy. The occurrence, then, of diplopia in the left half of the visual field, with increasing separation of the images as the object travelled farther towards the left, indicated palsy of one of the muscles concerned in moving the eyes in that direction, and this muscle was the rectus externus of the left eye (sixth cerebral nerve). When the object was raised above the level of the eyes an oblique vertical separation of the images was observed, and though her statements were not invariably consistent as the result of repeated observations, we inferred that the muscle at fault was the inferior oblique, which, you know, is supplied by a twig of the third cerebral nerve.

In this diplopia, then, there was evidence of the implication of the left sixth and third; the palsies were not complete, they were partial in degree, and involved one twig only of the latter nerve. Were their causes central or peripheral? Let us for a moment assume that all these palsies, including that of the right portio dura, were of central origin. It is evident that a central cause, implicating several nerves, must be a widely-spread one, and, in the presence of such, it is scarcely

conceivable that other nerves, the central nuclei of which are not widely removed, as the fifth, the eighth, and the ninth, would all have escaped. Then, also, the patient had no trace of sensorial disturbance and none of the other grave symptoms usually present in bulbar disease, so that here the probability was in favor of a peripheral origin of the palsy of the left fourth and third nerves. You will remember when she looked upward her left eye lagged a little behind the right; though, tested separately, we could not discover any absolute diminution of mobility of the left eye, yet in the consensual movements we thought it lagged slightly. Here was a possible source of error. In testing the mobility of an eye you note the position of its cornea with reference to such fixed points as the canthi and the free edges of the eyelids. But here, in presence of the paralysis of the seventh nerve on the right side, the palpebral fissures were so dissimilar in contour that a strict standard of comparison was wanting.

I have said that there appeared sufficient grounds for considering the right facial palsy peripheral and due to the implication of the portio dura in its bony canal. Regarding the seat of implication of the left third and sixth nerves we cannot be so confident. It may be within the orbit, or before they enter this as they pass through the dura mater, and if in the latter situation it would afford ground for fearing that the inflammation which began in the pericranium had spread to the underlying bone and from this to the dura mater, setting up osteitis and pachymeningitis. The concurrence of external and internal inflammation is not an infrequent circumstance in connection with injuries of the skull. Her extreme headaches cannot alone be taken as symptomatic of pachymeningitis in the absence of other symptoms pointing to this affection. But chronic pachymeningitis is a disorder of which the symptoms are often so vague, so indefinite, that its absence here cannot be positively affirmed. Indeed, one circumstance might be cited in favor of its presence, the prolonged and irregular fever, which is greater than one would expect from a simple pericranitis.

Remembering that I said that the fact of the entire facial part of the right portio dura being involved was rather in favor of a peripheral than of a central origin, some of you may object,—“If so, how do you explain the case of the left third nerve, of which you say the palsy is probably peripheral while one twig only is involved?” When you recollect how very close together are the root-nuclei of the third nerve, each destined for one of the muscles this nerve supplies, the improbability is extreme that one root alone should be involved

(in presence of a wide central disorder) while all the adjoining roots escaped. This consideration increases the possibility of a peripheral origin. The supposition of syphilis suggested by the early death of all the patient's children is consistent with the course of her disorder, and it is supported by the results of treatment. When she first entered the hospital the question of syphilis was considered, and it was thought, upon the whole, at that time, before we had had much opportunity of observing her, that probably she was suffering simply from traumatic pericranitis. Later, the presence of a syphilitic factor gained ground, and she was given iodide of potassium, but without obvious benefit. After her return the dose of iodide of potassium was increased from five to fifteen grains three times a day, and this was followed by improvement. Her headaches became very much less severe, and, though no diminution in the bulk of the temporal and post-mastoid swellings was observable, they became less tender. Upon observing this, the dose of iodide of potassium was increased from fifteen to twenty grains, and apparently with advantage. The ocular palsies disappeared. This improvement was unbroken until to-day, when she complained greatly of noises in the head (tinnitus aurium in the left ear), with absolute loss of hearing; and complete palsy of the left facial nerve is now unmistakably present. Such an extension of the disorder while under an antisyphilitic treatment does not, however, exclude the hypothesis of a syphilitic origin, and the potassic iodide will therefore be continued.

SCIRRHUS OF THE BREAST; EPIPHYSEAL FRACTURE OF THE UPPER END OF THE HUMERUS.

CLINICAL LECTURE DELIVERED AT THE RUSH MEDICAL COLLEGE CHICAGO.

BY CHARLES T. PARKES, M.D.,

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SCIRRHUS OF THE BREAST.

THIS patient is fifty-five years old and has had a growth in connection with the right breast for three years. She discovered it about that long ago as a small lump in the lower outer portion of the gland, which had previously given rise to no trouble. There was no pain and no tenderness, but, when first discovered, she noticed the character of extreme hardness belonging to the abnormal body. Now she comes to us with this tumor, which moves freely with the breast in the subjacent tissues as the position of that organ is changed. The skin can be moved over the surface of the tumor only around the outer circumference of the gland, being fixed and immovable over the greater portion of its central part. The tumor is about six times as large as when first discovered, and now approaches the size of an orange. Until one year ago there was no discoloration of the skin; now there is plainly visible a dark-red color over the tumor itself, being darkest immediately about the nipple and its areola.

There is also a noticeable peculiarity present, in that for some distance beyond this brawny area there is to be seen a very marked dimpling. This corrugation of the skin and the retraction of the nipple which is present are due to the fact that the growth, by its inherent power of contraction, draws upon and shortens the galactiferous tubes and the vertical bands of fibrous tissue which connect the skin with the deeper tissues. The retraction of the nipple is not so marked as in many of these cases, because the growth surrounds rather than implicates the lacteal tubes; but the tumor shows plainly

its remarkable effect on the skin covering it. This contraction and its effect on the nipple and skin should be remembered and appreciated when seen, as its presence is a sure indication of the malignant character of a tumor, no matter how slight its manifestation.

This is a tumor of rather slow growth, but shows the disposition to infiltrate and take up into itself all the surrounding tissues. It is also likely to ulcerate, as indicated by this blueness of the surface, marking the commencement of interference with the circulation of the skin which will finally lead to its degeneration and destruction.

It is evidently a malignant tumor which requires removal, and we will proceed to excise the entire mamma, as it would be useless to remove simply the tumor itself.

The incisions made in performing the operation should divide tissues widely removed from the gland itself or any local manifestation of the disease in the shape of hardness in the surrounding tissues. There should be no hesitation in sacrificing any amount of tissue when suspicious in character, if one expects by operation to prevent return of the disease. No regular rules can be given or followed for the directions of the necessary incisions. They must be made so as to go wide of all manifestations of infiltration or morbid implication of tissue. Neither should the question of the time expended in the operation be an item of consideration. Aim always to do the necessary work well and thoroughly.

The lower incision is usually best made first, and the knife is carried rapidly through everything down to the muscular investment of the chest wall. The lower border of the gland being uncovered, the entire mamma is dissected from the surface of the pectoralis major muscle. My plan is to remove the fascia covering this muscle, freely exposing the muscle-fibre until the mass is held by the skin-covering at its upper border, which is finally divided. The procedures thus far illustrate this method perfectly. The fascia of the muscle is removed with the tumor, because experience has shown that a manifestation of the return of the growth is extremely apt to occur in this tissue if it is not removed. Bleeding vessels are caught by forceps as soon as divided, so that comparatively little blood is lost even after very extensive excision.

Now I carefully examine every portion of the fresh surface to ascertain whether any hardened tissue has escaped removal; if any is found, it is unhesitatingly and widely removed.

It is seldom that a malignant tumor of the breast is unaccompanied by infiltration of the lymphatic glands of the axilla in some

degree, perhaps unrecognizable from external examination, but still certainly present. Hence it is necessary to open the axillary space by prolonging the incision across it just below its anterior border, divide carefully the superficial and deep fascia forming its floor, and uncover at once the axillary vein as a guide to the situation of the vessels and nerves on the outer wall of the axilla. Here, as elsewhere during any operation, first uncover the point from which most danger is anticipated. When the vein is uncovered and held out of the way, all other important structures go with it, and the axilla can then be easily cleared of the enlarged glands embedded in loose fat. This should be done thoroughly in all directions, leaving nothing behind that shows any evidence of disease.

You remember that in this case I could feel no enlarged glands before the space was opened, and now you see that I uncover several concealed by the pectoral muscle and beneath the clavicle.

In removing a malignant tumor always avoid cutting into the growth. Also avoid pressure upon it, for I am satisfied that harsh manipulation often leads to direct infection, followed by rapid return of the disease.

By care all the loose tissue in the axilla is cleared out and with it such glands as may be found therein. Here, you perceive, the search has been rewarded by obtaining quite a number of all sizes, although none were found by careful external examination. It is needless to say that many glands, enlarged sufficiently to be an evidence of the extension of malignant process, cannot be found without this exploration, and the operation is not complete without the removal of such tissues. This mass of dense fat in the region of the wound is a source of danger, and hence is dissected out.

The borders of the axillary space should be examined carefully, because enlarged glands are very apt to be found in this region.

In order to provide for drainage through this lower portion of the wound, I shall thrust a pair of scissors or a knife through the tissues at the most dependent part. This will be the direction in which the drain will naturally flow, as the patient will be on her back most of the time during the process of repair.

Having removed all evidences of the disease, the wound is closed by approximating its edges with the continuous catgut suture applied in two rows. The first row of stitches is introduced some distance away from the edges of the wound and rather far apart, to act as stay sutures; and the second row, for close approximation, is introduced in the intervals between the first.

A large external dressing of iodoform-gauze and borated cotton is applied, and held in place by a body bandage. This dressing is left in place for a week or ten days, unless the patient shows a rise of temperature. All going well, when the dressing is removed, the wound will be found entirely healed, as you have seen many times in cases shown you. It is well to prevent motion by bandaging the arm to the body. As a rule, these tissues will unite in three or four days, provided they have had good drainage preventing distention of the wound with serum. If, after the first dressing is removed, the wound be not absolutely dry and perfectly healed, but show signs of redness along its edges, we shall apply for a few days a wet antiseptic dressing made of a few folds of sterilized cheese-cloth dampened with a two-per-cent. solution of carbolic acid, and covered with some impervious substance, such as oiled silk or rubber tissue. This same wet dressing is to be used for the relief of inflammation in the wound earlier in its course, provided infection has inflamed its edges and necessitated earlier disturbance of the dressings.

Now let us examine the tumor itself. As you see, the discoloration is not entirely lost, even after the flow of blood has stopped. You must notice the hardness, which is characteristic of this variety of malignant tumors, and from which the name of scirrhus is obtained,—stone-like. It constitutes a pathognomonic sign. You will notice the little depressions which show the fixation of the tumor in the investing skin, also the freedom of movement of the breast on the deep tissues and beneath the skin. The degree of mobility of the tumor on the chest walls is always a sign for which you look in case you advise an operation. If the mass is immovably fixed to the chest walls, an operation will do no good whatever and should be discouraged.

In order that you may not be deprived of examining the characteristics to be noted in the tumor itself, I will open this specimen in such a way as not to destroy them before passing it up to you. You will notice the juice which flows out of the incision upon pressure; it is milky in color. Notice also that, instead of the cut surfaces bulging and being convex, they are concave. There is one point always to remember,—the extreme hardness of the mass always present in this variety of malignant tumor of the breast. It is remarkably evident in this specimen.

When speaking to you a few days ago about a chronic abscess of the breast of a tubercular character, your attention was called to its very slow formation and to the fact that it is apt to have very thick walls and to be so freely distended with its fluid contents as to give to it a

sensation of hardness almost as marked as in the case of this tumor. You are therefore to remember, in making a diagnosis, if there is the least doubt in your mind about the mass deep beneath the skin, with no external signs peculiar to the pointing of an abscess, you must never say positively that the trouble is this or that until you have explored it. If you introduce the exploring-needle, the presence of a scirrhus tumor is determined the moment the needle touches it, as its tissue is so dense that one can scarcely force the point of the instrument through it. Again, if it be not an abscess, there will be no flow of pus through the needle. The most scientific and experienced of men have made the mistake of removing a breast for an abscess, thinking it to be a malignant growth.

Usually you will be able to reach a satisfactory diagnosis from the manner of development of scirrhus tumors by remembering their disposition to draw all surrounding tissues into them, their extreme hardness, the retraction of the nipple, the peculiar stinging pain, the lymphatic infiltration, the disposition to ulcerate, and the presence of cachexia. The symptoms of retraction, fixation, and infiltration are positively diagnostic, occurring only in malignant tumors. As soon as there is progression towards the surface there is pain, peculiar in character, and which increases in severity according to the degree of the development of infiltration. Still it is not a sign to be implicitly depended upon. It is frequently absent, and patients are often astonished on being informed that there is a malignant growth in the breast, and assert that there has been no pain in it. The pain is described as darting, stinging, and shooting. In eliciting evidence as to its character, never suggest to the patients a name for the pain they may suffer. It is the same kind of pain which accompanies nerve-compression from any source,—a stinging pain, not a steady ache or throbbing.

When an open sore is produced by ulceration, the difficulty is increased immensely. The disease becomes more disgusting to the patient and friends, since the ulcer is apt to be unhealthy and foul, and the discharge from it fetid, and of an odor which cannot be destroyed and which permeates all parts of the patient's room and house. You can often detect this peculiarly offensive odor when opening the patient's door for the first time, and be able to make a fair diagnosis at once without seeing the patient.

There is some variety in the rapidity of the growth manifested by scirrhosis of the breast. Some cases are slow in development, but the majority have a natural history not exceeding thirty-six months. Again, cases are frequently met with which pursue an exceptionally

acute course, the symptoms mentioned appearing and progressing with astonishing rapidity. Other cases are noticeably chronic in nature; ulcerate early; instead of increasing in size they diminish, and are accompanied by a peculiar and remarkable drawing in or puckering of the surrounding tissues towards the crater-like ulcer. This variety is sometimes called atrophic scirrhus of the breast. Occasionally the disease is accompanied by extensive infiltration of the skin and subcutaneous tissues; the area affected is dusky, hard, brawny, and immovable, with stone-hard nodules scattered throughout its surface, constituting a variety termed *cancer en cuirasse*. I have seen such cases in which fully one-half the chest and most of the arm were infiltrated in this wonderful and terrible manner. Sometimes a large, easily-bleeding mass of granulations projects from the ulcer, giving rise to the name of "rose cancer."

In making an examination of the breast for the purpose of discovering the earliest manifestations of cancer, go carefully over all portions of the mamma both with a light and a firm touch. It is said that even a small characteristically hard lump will be more easily discovered with the patient in a recumbent position and while pressing the breast tissue against the chest walls.

You are to advise immediate operation as soon as the characteristic tumor is discovered; for, if the operation is to be curative, it must be executed while the disease is local in its manifestations. It is also advisable to operate even if the case has progressed so far as to implicate the lymphatic glands to a moderate extent, for by operation you can at least often relieve pain, get rid of the tumor, and add to the patient's term of life by interrupting its growth. Extensive infiltration contraindicates operation, as does wide ulceration or broad fixation of the tumor. I have occasionally thought it advisable to operate merely for the purpose of removing a horribly offensive mass and relieving the patient of its great annoyance.

EPIPHYSEAL FRACTURE OF THE UPPER END OF THE HUMERUS.

This boy, ten years of age, fell from a fence five weeks ago and suffered some damage thereby, as is shown by this unusually well-marked projection, about two inches below the acromion process on the anterior surface of the arm.

In examining the character of the damage done by violence applied to any portion of the extremities, you must always compare the injured part with the corresponding point of the uninjured extremity; for in that you have an unerring guide to refresh your minds as to the nor-

mal condition, and will be able, with some degree of certainty, to detect displacements in the injured member. Now, as the injury in the case before us is close to the shoulder-joint, let us first ascertain if there has been any damage done to the joint itself on the injured side, by carefully comparing the salient landmarks of these two shoulders. In this case the condition can be determined with the utmost degree of certainty, because such a length of time has elapsed since the injury that all swelling from effusion of blood or serum has disappeared from the neighborhood of the injury.

Feeling first along the entire extent of the clavicles, it is found, both by touch and by sight, that they are exactly the same on the two sides. Next, a thorough examination of the length of the spinous processes of the scapulæ fails to show any deviation from the normal condition. Therefore we can unhesitatingly assert that there has been no injury done to these bones. So, also, the acromion processes of both sides are easily manipulated by the fingers, and ascertained to be free from any deviation in contour and from the existence of any abnormal motion. Now, hiding the seat of the deformity from view with my fingers, we compare the general aspect of the two shoulders, and find that there is no difference whatever between them ; they possess the same roundness, evenness, and smoothness of contour on all their surfaces. Next, we put the extremity through the motions permissible at the shoulder-joint, and find that there is some limitation to the full degree of motion on the injured side. Still, it does move freely and easily in all directions within this limited range of motion. We examine the axillary space, and find that it contains nothing abnormal. From these facts we conclude positively that in this case there is no injury whatever of the joint itself.

Next, we examine the humerus, and find, first, that its direction is changed as compared with the uninjured bone, that its lower end projects too far backward, and, upon inspection of the upper end, we easily discover this unusual prominence just below the shoulder-joint, and also ascertain that it is directly continuous and in a line with the shaft below. Hence there has been in this case a solution of continuity, or fracture, at the upper end of the humerus, followed by the forward displacement of the upper end of the lower fragment. It has been displaced so far forward that it stands entirely away from the direction of the short fragment still attached to the head of the bone ; the broken surfaces are absolutely separated from each other.

Now, I ask you to remember the boy's age, a very important fact to bear in mind in determining, in children, the diagnosis of an injury

to the long bones close to their extremities. Your knowledge of the development of the long bones brings to your mind immediately the recollection that just here is a weak point. It is produced by the epiphysis, or rather the line of cartilaginous deposit between the epiphysis and diaphysis, which remains unossified until about the eighteenth year, in order to provide for the increase of the bone in length. So that, in all these cases, if you bear in mind and can determine the presence of the well-known signs of fracture, such as swelling, pain and ecchymosis, loss of contour, deviation in direction, proximity to a joint, prompt recurrence of the deformity after perhaps easy reduction, and crepitation, you will scarcely ever fail to recognize the existence of an epiphyseal fracture, such as was certainly produced in this case from the fall which this boy suffered five weeks ago. This is certainly true so far as this case is concerned, now that the obstacles to the recognition of the normal landmarks have entirely disappeared with the total absorption of all effusion. When the part is greatly swollen and the subcutaneous tissue overfilled with such effusion of blood and serum as would obtain immediately after the injury, the determination of the exact nature of the injury might be attended with the greatest difficulty and uncertainty,—in fact, might have been absolutely impossible.

This case also gives an excellent illustration of angular deformity, forward in this instance and extreme in degree. It also demonstrates that firm and solid union will take place between broken bones, even if the broken ends are not anywhere in contact with each other, provided one of the broken ends is held in contact with some portion of the shaft of the other fragment.

Notice, again, that, notwithstanding the presence of this deformity, the boy has a very useful and movable joint. The extent of range of motion is limited somewhat, but with use will increase from day to day until it is restored quite to the normal condition.

Is any operation advisable in this case to overcome the deformity? I think not, unless it be the rather simple one of exposing the upper end of the lower fragment and chiselling away this projection, mainly to prevent ulceration of the skin covering it, which seems imminent.

The dressings necessary to apply in a recent case of epiphyseal separation or fracture of the upper end of the humerus are simple, and I will illustrate their application on this boy's uninjured arm.

Take a strip of adhesive plaster two inches wide and a little longer than is sufficient to reach entirely around the patient's body; make a loop in one end of it considerably larger than the circumference of the

patient's arm at the seat of the injury. This loop can be made permanent by a safety-pin or, better, by sewing it. It is now carried over the extremity and over the humerus until it reaches just to the upper end of the lower fragment. The deformity is then reduced by pressure backward at this point with one hand, while the opposite hand at the elbow makes extension and at the same time draws the elbow forward. While the arm is held in this position, with the deformity reduced, the plaster is carried around the patient's body over its posterior surface and held in contact with its surface until adherent. The elbow is then fastened in its forward position by a second strip of plaster carried around the elbow and over the opposite shoulder in front of the body, and the hand and forearm are supported in a sling.

You can readily understand the mechanism of this arrangement: the loop of plaster around the upper end of the humerus, when fixed by its attachment to the body, is the fulcrum, the long humerus is the lever which reduces the deformity, and the second strip of plaster holds the lever steadily in position. The loops of plaster surrounding the arm should always be much larger than the circumference of the latter, in order to avoid impeding the return circulation. This dressing is very simple, is easily applied, the necessary materials are readily obtained, and it is thoroughly effectual. It should be examined, as every other dressing for fracture should be, from time to time, to ascertain whether it properly fulfils the requirements of the case. I have always found it proper to introduce between the arm and the side of the chest a single thickness of muslin, to prevent excoriation from retained secretions. The dressings should be retained in perfect position for at least four weeks.

WYETH'S HIP-JOINT AMPUTATION IN A CASE OF CYSTIC SARCOMA OF THE THIGH.

A CLINICAL REPORT.

BY J. MCFADDEN GASTON, M.D.,

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THE high rate of mortality attending amputations at the hip-joint comes in part from shock and the general impairment of vitality resulting from the disease or injury involving the thigh; but the great liability to undue loss of blood in the course of the operation has contributed largely to the untoward results, and the various appliances heretofore resorted to for controlling hemorrhage have not always averted serious consequences.

The average general fatality from hip-joint amputations is about sixty-four per cent., while the results in military surgery, in immediate operations, runs up as high as ninety-three per cent. In cases of disease calling for amputation, the mortality descends nearly to forty per cent. The results of secondary amputation occupy an intermediate place, and about sixty per cent. recover in civil and military surgery combined.

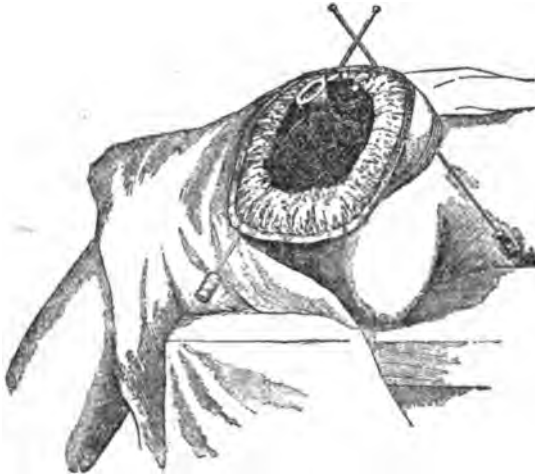
In view of these unfavorable statistics, it becomes an important consideration to find a means of effectually preventing hemorrhage, and such has been devised and put into effect by Dr. John A. Wyeth. In the *International Journal of Surgery* he remarks that "the terrible death-rate after hip-joint amputation is chiefly due to hemorrhage. Compression of the aorta or common or external iliac has not rendered the operation less dangerous. The figure-of-eight elastic bandage of Esmarch carried above the iliac crests or around the abdomen, and the transfixion by a single needle passed in front of the neck of the femur and beneath the vessels, over the ends of which a rubber cord is carried only in front of the thigh, as advised by Trendelenburg, or the

rubber spica of Furneaux Jordan, are improvements on older methods, but are far from satisfactory." His method is as follows:

The patient being placed in position, with the hip of the side to be operated on well over the corner of the table, the foot is elevated and an Esmarch bandage applied to drive the contained blood towards the heart. The bandage should not be tightly put on over the seat of the disease for fear of driving septic matter into the circulation. With the rubber bandage still in position, the needles are next introduced.

Two steel mattress needles, three-sixteenths of an inch in diameter and a foot long, are used. The point of one is inserted an inch and a half below the anterior superior spine of the ilium, and slightly to the inner side of this prominence, and is made to traverse the muscles and

FIG. 1.



Stump showing the relative positions of the needles, the rubber tubing, and the surrounding parts.

deep fascia, passing about half-way between the great trochanter and the iliac spine, external to the neck of the femur, and through the substance of the tensor vaginæ femoris, coming out just back of the trochanter. About four inches of the needle should be concealed by the tissues.

The point of the second needle is entered an inch below the level of the crotch internally to the saphenous opening, and, passing through the abductors, comes out about an inch and a half in front of the tuber ischii. No vessels are endangered by these needles. The points are protected by corks to prevent injury to the operator's hands.

A piece of strong white rubber tube, half an inch in diameter and

long enough when tightened in position to go five or six times around the thigh, is now wound very tightly around and above the fixation-needles and tied. (See Fig. 1.)

The Esmarch bandage is removed, and five inches below the tourniquet a circular incision is made, and a cuff, which includes the subcutaneous tissues down to the deep fascia, is dissected off to the level of the lesser trochanter, at which level the muscles and vessels are divided squarely and the bone sawed through.

All vessels (including the veins) which can be seen are tied with catgut, and the smaller bleeding points can be discovered by slightly loosening the tourniquet, which is then entirely removed.

The remaining portion of the femur is now easily enucleated by dividing the attached muscles close to the bone and opening the capsule as soon as it is reached. On lifting the end of the bone in the direction of the patient's navel, and dividing the cotyloid ligament posteriorly, the air enters the cavity of the acetabulum and greatly facilitates the division of the ligamentum teres.

The closure of the wound, with proper drainage, follows. The entire procedure requires the strict asepsis of modern surgery.

One other important point Dr. Wyeth emphasizes,—viz., the advisability in certain cases of doing this operation in *two sittings*.

In one of his cases the patient was greatly exhausted, and after dividing the femur at the lesser trochanter and securing the vessels, fearing the supervention of shock, as indicated by the pulse, he closed the wound, which healed by first intention. At the first dressing (on the seventeenth day), the remaining portion of the bone was removed by an incision over the trochanter major. The recovery was uninterrupted.

In neither of his cases was there any bleeding, and, *in fact, amputation at the hip-joint is now a bloodless operation.*

In addition to his two successful cases presented to the Section of Surgery of the New York Academy of Medicine, in which this operation was done on account of sarcoma of the thigh, Professor Wm. F. Fluhner and Charles McBurney report two brilliant results, making in all four consecutive cases of recovery. At that writing these were all in which his method had been employed.

Another hip-joint amputation by this method has since been done by me, of which the following clinical report is given.

A patient in the National Surgical Institute, under the care of Drs. K. H. Boland and J. T. Renouff, suffering from a very large cystic sarcoma of the left thigh, involving the bony structure, came under

my observation early in the month of October. After several gallons of a dark-brown fluid had been withdrawn, it was found that the cyst filled again within a few days. A general tonic treatment was adopted with a generous diet preparatory to an operation, which presented the only prospect of relief for the sufferer. A thorough cleansing of the entire body and sponging of the pelvic region with a solution of corrosive sublimate was employed. On the 12th of November, 1890, all being in readiness, the young man expressed his willingness to undergo amputation at the hip-joint, even should there be serious doubts as to his surviving the operation.

A hypodermic injection of morphia, one-fourth of a grain, and atropia one one-hundred-and-fiftieth of a grain, being given with a drink of two ounces of whiskey, he was placed under the influence of the A.-C.-E. (alcohol, chloroform, ether) mixture, this being my choice as an anæsthetic in all grave operations.

An attempt was made to remove the blood from the tumor by an elastic strap extending from below the knee up to the trochanter, but the Esmarch bandage was ultimately abandoned for the effect of gravity by elevating the mass with the limb, weighing about as much as the remaining portion of the patient's frame.

Having the counsel of Dr. Joseph Price, of Philadelphia, who was in attendance upon the meeting of the Southern Surgical and Gynæcological Association, and the assistance of Drs. Boland, Renouff, Nicolson, Giddings, Earnest, and Divine, the steps taken were as follows :

The external iliac artery was ligatured immediately above the pubic bone ; cutaneous flaps were made by incisions from the upper margin of the trochanter to the inner margin of the ischium, anteriorly and posteriorly ; mattress-needles were passed through the entire structure and the points cut away on each side close up to the pelvis with a pair of strong wire-nippers, and a strong rubber tube was carried around tightly above these two retaining pins ; the muscles were divided, commencing on the inner and anterior aspect of the thigh and carrying the knife around on the outer part ; on reaching the site of the femur it was found degenerated and softened so that there was no difficulty in cutting through it with the amputating knife and thus detaching the limb with the tumor. In the mean time openings had been made into two cysts, evacuating, as was estimated, at least two gallons of dark-brown fluid. In spite of this loss, the tumor, after removal, weighed seventy-three pounds.

There was no considerable loss of blood, and but few points required the application of forceps, while only two ligatures were requisite

subsequently. The enlarged trochanter, measuring six inches in diameter, hugged closely the outer surface of the ilium and encircled the acetabulum. Bone-forceps were used in raising the margins, while the separation was effected with the knife, detaching this degenerated mass of cartilaginous consistence from the head of the femur, resting in the concavity of the acetabulum. A further employment of forceps and knife completed the removal of the softened head of the bone. The elastic tourniquet had been previously slackened and was now entirely released, with removal of the pins, giving another successful result in the use of the process suggested by Dr. Wyeth.

There being some general oozing, not controlled by the application of hot carbolized water, the entire incised surface was sponged with a mixture of spirits of turpentine and camphor, in the proportion of one ounce of the former to one drachm of the latter. This was followed by a prompt arrest of the sanguineous exudation.

The irregular muscular stumps were turned into the acetabulum so as to fill up this cavity, and the cutaneous anterior and posterior flaps were closed by interrupted suture, leaving a drainage-tube embedded in the tissues from the acetabulum to the external line of union. The large, flabby mass constituting the stump was dusted over with iodoform, and a layer of iodoform-gauze, with a compress of cotton, was firmly secured by a roller bandage carried around the pelvis, which completed the steps of a most serious operation.

The patient showed but little shock, and the resort to a few hypodermics of sulphuric ether alternated with whiskey soon restored his powers. A ten-grain dose of quinine was given in the afternoon.

For the first twenty-four hours all seemed to progress favorably, but then supervened a colliquative diarrhœa which continued for ten days in spite of the most energetic measures, leaving the forces of the patient greatly reduced.

During the first week there was considerable serous exudation from the wound without any union of the skin; and at the end of two weeks indications of suppuration were marked. With frequent washing out by a solution of permanganate of potash, followed by the injection of peroxide of hydrogen, the case seemed, on the eighteenth day, progressing favorably, with a normal temperature and resting well. The diarrhœa had ceased and his bowels were only moved two or three times in twenty-four hours. His appetite was fair and he took food regularly, using milk liberally. In the daily dressings of the wound a moderate quantity of thick pus was discharged apparently from the direction of the acetabulum. The temperature averaged



FIG. 2.—Osteo sarcoma of the femur.

about 101° F. and the pulse one hundred and twenty beats to the minute. The patient took a moderate amount of nutritious food and was in good spirits.

The union of the edges of the wound was being effected, leaving only a central opening in the flaps for drainage, and the suppuration had diminished so much that daily dressing was not thought desirable, so that the wound was not disturbed until the third day. It was then noted that his pulse had somewhat suddenly run up to one hundred and forty beats and his temperature to 104° F.; but after the thorough washing out of the wound and giving a ten-grain dose of quinine, the patient was found on the morning of the twenty-first day in a very satisfactory condition. He continued to take small doses of quinine with whiskey and tincture of the chloride of iron every six hours, using lager beer in the intervals.

On December 6 the temperature was 102° F., pulse 130, with a somewhat serous character of the discharge from the wound. At midnight there was marked prostration, increasing until his death at seven o'clock on the twenty-sixth day after the operation.

The photograph (Fig. 2) represents accurately the outline of the tumor, which had commenced three years ago, but only became a source of great inconvenience by its size within the past year. The brief clinical report of the operation does not present the facts of the encroachment of the upper portion of the tumor upon the pelvis and the necessity on this account of dissecting the anterior flap from the surface of the tumor, embracing skin which was under great tension. The retraction of the cutaneous tissue was so great upon its separation, that a proportionally large flap was provided on the posterior aspect, so as to compensate for the contraction, thus affording an ample covering for the stump.

It is evident that the diarrhoea could not have resulted from the external applications, as no corrosive sublimate was used in the washes after the skin was incised. The lowering of the vitality from the diarrhoea was the precursor of the final prostration; and yet it must appear that the failure to open the stump for three days led to septic contamination, which was the immediate cause of the fatal result. It is realized fully that but for this oversight, the case ought to have had a favorable termination.

CANCER OF THE PENIS.

TWO CLINICAL LECTURES DELIVERED IN THE NEW HAVEN HOSPITAL.

BY W. H. CARMALT, M.D.,

Professor of Surgery in the Medical Department of Yale University.

GENTLEMEN,—I ask your attention to-day to this negro, who is about fifty years of age; of, as you see, very considerable obesity, and presenting, so far as we can observe and detect, except in the organ to which I shall direct your attention, the appearance of good, even robust, health. He is unmarried, and denies emphatically ever having had sexual connection, though the emphasis of his denial, I must say, casts a suspicion upon the truthfulness of his history. One is reminded of the quotation from Hamlet, "Methinks the lady doth protest too much." Be that as it may, however, he absolutely refuses to acknowledge any relation of the disease from which he now suffers with any sexual connection. He states that about two years ago he first noticed what he calls a little lump on the skin of the prepuce, which, in the course of a few weeks, broke down,—*i.e.*, ulcerated on the surface. Other nodules formed in the skin of the vicinity and ulcerated, the foci of ulceration ran together, attacked the glans and corpora cavernosa, the tissue dissolved away, and the organ was destroyed, as you perceive. The ulceration and destruction of the penis has gone on until it has reached the level of the pubes and anterior surface of the scrotum. Practically the organ no longer exists.

The patient has delayed seeking relief from his disease longer than is usual, and the particular form in which the disease presents itself is somewhat unusual in this situation, so that the appearances are not those usually met in carcinoma of the penis, the disease of which this is an example.

The disease appears generally in the so-called papillary as distinguished from the medullary form, or as again distinguished from the small cell-growth known as the rodent ulcer, or rodent cancer. When it occurs in its most frequent form,—*i.e.*, the papillary,—

it appears in large masses, deforming the part to an extraordinary degree, often increasing its size rather than otherwise. Such a case was in the hospital last summer under the care of one of my colleagues, where the penis was increased to six or eight times its normal size and the extremity misshapen and distorted into a veritable cauliflower excrescence. But in this case the ulceration is apparently in the comparatively infrequent form of the so-called rodent ulcer, in which the tissue is eaten away locally, but in which there is very little implication of the contiguous lymphatic glands. There is probably no position in the body where the secondary glandular involvement masks the original disease so much as it does in cancer of the penis. A case was in this hospital about five years ago of a man admitted with the statement of his family physician that he had buboes, although the patient denied any venereal disease. On examination, I found both groins occupied by great masses as large as my double fists, ulcerating on the surface and stinking beyond description. These were, he said, his only lesions. I made an examination of his penis and found that the glans had entirely disappeared. He had a complete phimosis; the external portion of the prepuce was intact and presented no change to a superficial examination; but on attempting to uncover the glans I found the prepuce indurated and the manœuvre impossible, and the glans penis itself entirely gone. The disease had begun there, and had entirely destroyed it, without his having been aware of any inconvenience except a slight discharge from the contracted orifice of the prepuce, which he had never been able to retract. The first thing that he recognized was a swelling in the groin. He lived several months after admission, but in a most miserable condition, and died finally of exhaustion, without, so far as that goes, losing any considerable amount of the penis except the glans. The lymphatic gland of the groins, however, broke down and bled profusely, and subsequently carried him to his death by exhaustion. That is the most frequent condition, the secondary glandular involvement being greater than the original disease. Most frequently carcinoma of the penis attacks persons who have a non-retractile foreskin, so that the remark has been made that those of the Jewish persuasion never have cancer of the penis. One author makes the distinct statement that in a large number of cases, and practising in a Jewish community, he had never seen cancer of the penis in a Hebrew. However that may be, and I have not had the opportunity to either verify or disprove the statement, certainly, among Gentiles, it does occur much more frequently in those whose foreskins are non-retractile. This negro, however, states that previous to the infiltration of the foreskin

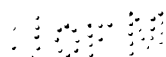
by the cancer it was retractile. The deduction drawn from this general statement is that carcinomata generally—and this is particularly evident in the epitheliomata or cancers of the skin—occur where there exists a long-continued subacute irritation, not marked enough to produce actual inflammation and ulceration in a person of mature life. I say of mature life, for carcinomata occur in persons of adult life in the vast majority of cases. In young persons they are almost never met.

Besides the ulcerating surface, which you can see, the disease has infiltrated the corpora cavernosa and the corpus spongiosum farther back, and I can feel through the scrotum nearly to the crura a mass of indurated tissue. For this condition of things there is but one method of treatment,—the immediate and total removal of all diseased tissue. We cannot afford to trifle with caustics or other temporizing expedients. In the ordinary cases involving simply the prepuce and the glans, or any part of the pendulous portion, we can, by transfixion, hold the organ in place and cut off the diseased part usually with one sweep of the knife, and then attach the mucous membrane of the urethra to the external skin, after which it unites without difficulty. Here, however, we shall be obliged to make the dissection through the scrotum, and possibly divide the corpora cavernosa from their attachments to the rami of the pubes and ischia; in other words, to perform the operation of extirpation of the penis rather than amputation of that organ.

You can readily perceive, by a simple contemplation of the parts, how difficult it is to achieve antisepsis. He is a very large man, with a great deal of adipose tissue and a greasy skin. It is nearly impossible to get at all the folds, and clean them out properly as we would like to do, but we have done the best we could. He has been repeatedly scrubbed with soap and water, and the parts have been wrapped in a dressing saturated with a solution of mercuric chloride for the last few hours. I have been unable to explore the urethra as much as I should wish on account of the pain it gives him, but I think the disease does not extend farther along that canal than it does in the bodies of the cavernosa, and that the point where I cut off the body of the penis will be far enough back to give healthy tissue for the urethra. This will, however, require that the incision be carried into the scrotum, and the urethra thus cut off will not reach to its anterior surface. It will be necessary to make an opening farther back, somewhere in the perineum. Whether the operation will require the castration of the patient or not is, under the circumstances, a matter of indifference, except so far as to increase to an uncertain degree the dangers of the

operation. As in the division of the penis so far back, one has less control over the hemorrhage (which, owing to the vascularity of the organ, is apt to be excessive), I shall use some form of cautery to accomplish the division of the corpora cavernosa.

I will now proceed to the operation, and, as a preliminary, pass an elastic bougie into the bladder to serve as a landmark. Owing to the induration of the tissue of the corpus spongiosum with cancerous infiltration causing a stricture which would not admit more than a No. 4 sound without causing him great pain, I have not examined the urethra thoroughly, but it can be done as well now while he is under the influence of ether. You see I can force the stricture to take a No. 12, and I pass with some little difficulty an olive-pointed flexible bougie of this size, which has now fairly entered the bladder. I now seize the stump of the organ with a pair of vulsella forceps and make a curved incision through the external skin on each side of and including the whole circumference of the organ. This requires the including of a portion of the scrotum, and as I carry the dissection down to encompass the mass, you see it is necessary to carry the incision along the raphe of that part. I find, now, that I have gotten beyond the induration and am apparently in sound tissue. I will now separate the corpus spongiosum, and its contained urethra, from the corpora cavernosa, and you perceive that the presence of the bougie in the urethra facilitates the manipulation. As I do this you also perceive, as the urethra is dissected away from the corpora cavernosa, that the bougie is exposed,—i.e., there is a rupture of the urethra. This occurred a few moments ago in the attempt to pass a small steel bougie, one that would go through the stricture. The tissue, while indurated, is also very friable, and gave way with the very slight force used; hence the necessity of using a flexible instrument of the shape indicated. Having separated the corpus spongiosum from the corpora cavernosa, carrying the dissection well beyond all appreciable evidences of disease, I find that I am still in advance of the point of juncture of the crura to form the body of the penis, and I will not be obliged to divide each one separately. I therefore proceed to cut through the body of the penis, using for that purpose the knife-point of the Paquelin-cautery, heated to a dull red, which you see divides the tissue of the corpora cavernosa with rapidity and without hemorrhage. These being divided, I now carry the dissection backward in the loose tissue of the scrotum to the perineum, and in the skin just posterior to the junction of scrotum and perineum make a "button-hole," through which I pass the bougie, still in the urethra. You see there is length enough and to spare beyond



the disease, and, dividing it on the bougie, I unite it by four stitches to the external skin. I will withdraw the bougie and insert a Nélaton catheter, through which he can urinate for forty-eight hours, or until union has taken place between the urethra and skin, thus avoiding all danger of infiltration of urine into the tissue of the perineum. You can readily see how much better off he is now than formerly, or than he would be if I left the urethra in front, for the urine would then dribble down over the scrotum, excoriating it and causing him great inconvenience.

I now examine for any implication of the inguinal glands; but, cutting into his groin and searching deep down in the fat for them, I do not find any, and I shall sew this wound up again. The original amputating wound over the pubes and in the front of the scrotum I now close, after washing it out with a solution of mercuric chloride of a strength of 1 to 1000, and insert a drainage-tube passing from the burnt amputated surface to the lower point of the incision in the scrotum. In both of these last incisions I use, as you see, a continuous catgut suture taken directly from ninety-five-per-cent., alcohol where it is kept for weeks before using, having previous to that been again disinfected by Kocher's method in the oil of juniper-berries. I use this suture whenever I am uniting a wound that does not require tension to keep the edges in apposition, as it secures more perfect approximation than any form of interrupted suture. If there were any considerable tension, I should use an interrupted silk suture. I fasten the drainage-tube in place with a silk suture, and having dusted the lines of incision with iodoform, place over it a couple of layers of Billroth's "sticky" iodoform-gauze, as modified by Weir, and over this again a dressing of gauze and jute impregnated with mercuric chloride. I secure all in place with a T-bandage. The operation is now complete, and I shall report next week upon the progress of the case. In the mean time the wound will be washed out with a solution of mercuric chloride 1 part to 4000 of water twice a day or oftener, depending upon the amount of discharge and febrile reaction.

REPORT UPON THE FURTHER COURSE OF THE CASE.

This patient is the man from whom you will recollect I amputated the penis a week ago. I shall show you the result so far obtained. As I told you, I did not anticipate a perfectly aseptic wound, and therefore did not expect that it would heal by first intention. As you know, also, the amputated surface was burned, and there must be an eschar

there to slough off. In spite of this, he had very little rise of temperature until the last two days. Yesterday there was a rise to over 103° F., for which we could not account until to-day, when we find an abscess at the upper portion of the wound where the stump of the penis was removed, the burned surface where the slough must necessarily be. While, in the main, the wound has healed along its whole surface, there are, as you see, three or four points where the union has not been complete and from which pus escapes. I think you will also notice that there is rather more œdema about the whole scrotum than there was at the time of the operation. The inflammatory process is extending a little, but I do not anticipate any trouble from it. The wound in the groin, which you will recollect I made for the purpose of exploring the inguinal glands, has entirely healed, and is as dry as can be. The wound behind the scrotum, through which he makes water, has also united, and he now has no trouble in passing the urine. The mucous membrane and skin are united in that position, and he makes water through this artificial urethra with comparative comfort and the stream is thrown from his person, this being better accomplished when he elevates the scrotum. The silk stitches uniting the mucous membrane of the urethra with the skin are still *in situ*, and I now remove them. We shall have this dressed and washed out a little more frequently than has been done. We shall have it done every three hours, simply allowing the solution to run through and out, and then have the dry dressing again put on. I shall also have the scrotum elevated a little better by having some adhesive plaster put across from one thigh to the other close up against the perineum, so as to form a sling upon which the scrotum may rest. I shall leave a small portion of the gauze on the adhesive side of the plaster in the centre, so that there will be no trouble from anything adhering to it; then, applying and pressing each end to the outer side of the thigh, you perceive we build a little platform upon which the scrotum may rest. Then we dust over the whole a good quantity of lycopodium powder, which is a good "baby powder," having no medicinal qualities, but merely acting as an absorbent, and which is the only dressing I shall put on there except this cushion or bag for a protection. His bowels are a little constipated, but that is easily regulated by laxatives.

[This patient was discharged on January 17, 1891, his stay in the hospital having been prolonged by reason of his having become salivated by the mercuric chloride and the peroxide of hydrogen used in the dressing.]

ABDOMINAL NEPHRECTOMY FOR PYELO- NEPHROSIS.

A CLINICAL LECTURE.

BY C. B. NANCREDE, M.D.,

Professor of Surgery and Clinical Surgery in the University of Michigan.

THE case which I shall now show you is that of a married woman aged forty-two years, the mother of four children, who was admitted to the University Hospital for a tumor occupying the left lumbar region. It is tender on pressure, of a somewhat bosselated irregular outline, and fills the space between the iliac crest and the ribs upon the same side, beneath which it extends, as well as backward into the region of the left kidney. Over the front and inner portion of the growth a line of percussion clearness, corresponding in extent to that of a collapsed colon, exists. This is a most important point, since it indicates with great certainty that the tumor is a retro-peritoneal one, and, as the only organ so placed in this region is the kidney, that the tumor is of renal origin.

The patient is emaciated, suffers much pain, and has been totally constipated for one week. The tumor has been noticed for only one month, but is manifestly of much longer duration. Fæcal accumulation being to some extent present, as shown by the history, a rectal examination, and the pitting of the tumor on pressure, it was at first hoped that this was the whole trouble; but although washing of the rectum evacuated a large quantity of fæcal matter, the bulk of the tumor remained. I have, therefore, decided to do an exploratory section, believing that the growth is connected with the left kidney; a view rendered practically certain by the foregoing facts. I believe, too, that the condition causing it is pyelonephrosis, as shown by the presence of large quantities of pus in the urine, and that the temperature and pulse indicate chronic suppuration,—i.e., modified hectic is present.

On account of the condition of the kidneys, chloroform will be used,

as I believe that this anæsthetic is less liable than ether to cause suppression of urine, the chief cause of death next to shock and hemorrhage. There are two routes by which the kidney may be reached and removed,—viz., the lumbar and the abdominal. By the former, unless the space between the ribs and iliac crest be great, no large tumor can be removed without applying a temporary elastic or other ligature, and the tumor be then cut away piece-meal, an expedient which I successfully employed recently in a private case with an enormously enlarged kidney. The alleged advantages of this method—the details of which I cannot refer to now—are that the peritoneum is not interfered with, and that the risk to life is therefore lessened; neither of which statements are absolutely true, as I will explain. One of the most skilful of operators found that after enucleating a kidney by the lumbar incision, one tear through the peritoneum, large enough to admit the hand, and numerous smaller ones had been made, though this was only determinable by the view obtained through the exploratory abdominal incision. Doubtless this accident often occurs with consequent fouling of the peritoneum. Again, it is probably in cases of smaller tumors and those with fewer complications that resort is had to the lumbar route. In addition to want of room to deal with adhesions and hemorrhage, it is impossible to determine the condition of the other kidney, especially its probable competency. Nay, more, cases occur, such as that of Polk's, where there is only *one* kidney, the removal of which must cause certain death. By the abdominal route more room for the removal of a large growth is obtained; it is possible to see the adhesions and to deal with them with more certainty, and the condition of the other kidney can be ascertained. Accordingly, I shall adopt Langenbuch's incision, aiming to strike the left linea semilunaris, but not wasting too much time in searching for it, since, after all, as I have so often told you when performing other abdominal operations, the additional hemorrhage is of no real moment, being readily controlled by pressure, and the resulting cicatrix is, if anything, firmer.

This patient's condition is so miserable that every drop of blood lost is of consequence, since hemorrhage, as I tell you so frequently, intensifies shock, and I shall therefore save all I can, even packing the wound with sponges as I enucleate the growth, if this seems advisable. Dividing the peritoneum, I come down upon an undoubted renal tumor; but disregarding this for the present, I shall introduce my hand into and across the abdomen until now I distinctly feel the right kidney, which seems normal as to consistence, shape, and size, and is therefore presumably competent to secrete enough urine.

Returning to the diseased kidney, which is evidently in a condition of pyelonephrosis, I press and keep aside the small intestines by means of this large flat sponge, search for and draw towards the median line the large bowel, and then make a small opening through the outer layer of the mesocolon. I do not cut through its inner layer, though it is a much more direct route, because most of the blood-supply reaches the colon through this layer, so that, when injured, gangrene of the bowel—one of the risks of nephrectomy—is more apt to occur. Enlarging this peritoneal opening by tearing, and endeavoring as much as possible meanwhile to avoid these immensely enlarged veins, which, as you see from the one I have unfortunately torn, can bleed profusely, I reach the renal capsule, which I now open. Carefully tearing loose the adhesions, I carry my finger down to the hilum of the kidney, hoping to be able to detect the vessels, isolate them, ligate them, and thus be enabled to enucleate the tumor with but little hemorrhage, but after most careful search, I am unable to recognize them with such certainty as would warrant an attempt to ligate them and divide the pedicle.

You may wonder why I do not apply one or more pairs of large pressure-forceps, as when dealing with an ovarian pedicle, but I am afraid to do so, for two reasons. One of these is that Thornton once resorted to this procedure, cut off the growth, and, when he removed his instrument, found that he had cut a V out of the ascending cava, the patient perishing before his eyes. The second is because in one case where I was the consultant and assisted at the operation, such an application of the forceps would have resulted in the seizure of the aorta, which was acutely bent, having been dragged into the tumor as it were.

The next best thing to do is to cautiously enucleate the growth from its capsule as rapidly as can be safely done, and, isolating the pedicle from the pelvis and ureter, if this is possible, transfix it, tying in two halves, but first interlacing the ligatures as you always see me do when removing ovarian growths. However, as you will observe, the adhesions in this case are so strong and so entirely beyond the reach of the eye and a reliably-placed ligature that I must twist and tear them loose by the exercise of an amount of force that you can hardly realize. As I separate this last cyst, which is so adherent to the lumbar fascia that it was probably on the point of perforating and setting up a perinephric abscess, I am so unfortunate as to rupture it, giving vent to some ounces of greenish pus. We will endeavor to prevent fouling of the general peritoneal cavity by properly-placed sponges, by rapidly

removing the pus, and by irrigation with sterilized water, and as I am *working within the capsule of the kidney*, and the small intestines have been kept out of the way by this large flat sponge, which you see comes out clean, except where it was in contact with the renal-capsule, I believe no pus has touched any peritoneal surface, except that of a loop of the large bowel, which I shall carefully cleanse.

The patient is now so profoundly collapsed that I must complete the operation with all possible speed, tying the pedicle as I said I should, and assuring myself of security against bleeding by throwing an additional ligature around the whole pedicle. Cleansing all the parts by irrigating with hot sterilized water, I place a glass drainage-tube within the capsule out of which I have enucleated the kidney, loosely packing around it four strips of iodoform-gauze, the ends of which will be secured outside, and then I suture the wound exactly as after other abdominal sections. If it had not been for the rupture of that cyst and consequent fouling of the sac, I should have dispensed with all drainage, but as I cannot be sure that I have secured complete asepsis, I have preferred to be on the safe side. The iodoform-gauze was used for a threefold purpose,—to insure additional drainage, to neutralize any pus-ptomaines present, and to check any oozing; for, as you see, with all the haste I could make, the adhesions were so dense that the operation took seventy minutes, and the patient has been for the past twenty minutes so profoundly shocked that life has been maintained only by the skilful attention of my colleagues, who have administered stimulants hypodermically, while at the same time Esmarch's bandages have been applied to the lower extremities, and the head allowed to hang over the edge of the table.

The usual measures after a severe abdominal operation will be employed, and if, first, shock can be overcome, secondly, suppression of urine avoided, thirdly, gangrene of the large bowel does not occur, then, peritonitis does not supervene, and, finally, secondary hemorrhage does not take place, the patient will recover. Quite a formidable list, but nothing but a literal representation of the possibilities. (Later on shock passed off promptly, but absolute suppression of urine terminated life in seventeen hours.)

CHOLELITHIASIS: WITH SPECIAL REFERENCE TO ITS SURGICAL TREATMENT.

CLINICAL LECTURE DELIVERED BEFORE THE STUDENTS OF THE YORKSHIRE COLLEGE.

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THE occurrence in my wards of five patients suspected to be suffering from gall-stones, and sent in for surgical treatment, led me to think that this might be a fitting occasion on which to give you a lecture on cholelithiasis.

Thanks to my medical colleagues and other medical friends, it happens that I have had a considerable number of these cases brought under my notice within the last few years, and only this week you have twice had the opportunity of seeing me perform the operation of cholecystotomy in the Infirmary. I have also done the operation once during the same time in my private practice.

I am glad to be able to state that out of nearly thirty cases in which I have operated for gall-stones in the absence of malignant disease there has been no mortality, and that the recovery of the patients has resulted in nearly all the cases in complete cure without recurrence of symptoms.

In a paper read before the Clinical Society of London on October 30, 1889, and published in the Clinical Society's Transactions, I gave the reports of fourteen cases, and in another communication given at the Leeds and West Riding Medico-Chirurgical Society in October, 1890, I referred to eleven others, a number of which had been operated upon on the strength of symptoms alone without physical signs. Since that time I have had other cases under my care, some of which you have had the opportunity of seeing.

We may consider cholelithiasis under several headings, and as far as possible I will draw on my own experience to illustrate my remarks.

1st, what are gall-stones? 2d, where and how are they formed? 3d, where may we expect to find them? 4th, what symptoms do they produce? 5th, how does nature strive to get rid of them? 6th, what are the dangers resulting from their presence? and, 7th. how can we treat them?

1. You will see by the specimens which I hand round, and all of which have been removed by the operation of cholecystotomy, that gall-stones vary very much in size and appearance, although their composition is tolerably uniform, in that they are generally formed of cholesterin.

The specimens in bottle No. 1, eight in number, are about the size of beechnuts and are faceted. They are brown in color and very hard, so that it would have been dangerous to crush them through the walls of the ducts, as I have done in several cases where I could not otherwise extract them. They were removed by operation from a lady, aged thirty-three, who has since enjoyed perfect health.

In bottle No. 2 the concretions, sixty in number, are white and soft, varying in size from a No. 3 gun-shot to a small bean. They are so soft that they are capable of being crushed between the finger and thumb. They were removed from a patient aged twenty-two, and as there was stricture of the cystic duct it was necessary to remove the gall-bladder to cure the mucous fistula which persisted after the operation. This patient is now in good health.

In bottle No. 3 the gall-stones, two in number, are of a dirty fawn color, very hard, barrel-shaped with flattened ends, and about the size of small walnuts. They were removed from the cystic duct of a woman, aged forty, in whom they had set up such irritation that the parts in the neighborhood were matted together and an abscess had formed, which had to be evacuated before the obstruction could be reached and removed. This patient is now quite well. Time will not permit me to describe all the specimens, but bottles Nos. 11 and 12 contain forty-two and seventy gall-stones respectively, removed from the gall-bladder and cystic duct of patients who had never been jaundiced and had never had tumor or other physical signs, but who had been subject to so-called "spasms" for six and seven years respectively. As an illustration of a large number of concretions in one case, two hundred and forty gall-stones were removed from one patient.

The last specimen is worth noting; it is a stone no larger than the kernel of a filbert, and non-faceted. This I removed by cholecystotomy on the strength of symptoms alone, the patient having had severe "spasms" for a year, one attack nearly proving fatal; yet this

was the only stone present, and it had become impacted in the commencement of the cystic duct. The gentleman, aged fifty, recovered without a bad symptom and is now in perfect health.

2. With regard to the formation of gall-stones, it has been said that they are always formed in the gall-bladder, and on the strength of this opinion, Langenbuch and several other surgeons prefer the operation of cholecystectomy to that of cholecystotomy, in order to remove, as they say, all future possibility of gall-stones being formed.

From my own experience I think there can be no doubt that gall-stones may be formed in the liver as well as in the gall-bladder, and I have myself opened an abscess in the liver from which a number of gall-stones were removed. I believe that Mr. Lawson Tait has also found gall-stones in the ducts of the liver, both of which facts, I think, are proof positive that gall-stones may be formed elsewhere than in the gall-bladder.

I think that it is very probable that the nuclei of gall-stones are formed in the liver, pass down the hepatic duct, then up the cystic duct into the gall-bladder, where they are retained and gradually increased by the deposit of cholesterin on their surface just as lithic and other calculi form in the kidney and increase in the bladder.

Possibly catarrh of the biliary ducts is a more frequent cause of cholelithiasis than is usually suspected, and on this subject Dr. Myrtle, of Harrogate, read an interesting paper before the British Medical Association in November, 1887, and advanced arguments that it was by relieving the catarrh that gall-stone cases were so much benefited by the Harrogate waters.

3. Where may we expect to find them? When these concretions of cholesterin forming distinct calculi are retained and produce a definite train of symptoms, we say that the patient is suffering from cholelithiasis or gall-stones, but on their situation, in a great measure, depend the symptoms they produce. Not infrequently the gall-bladder may be found post-mortem full of gall-stones, and yet no symptoms have occurred to indicate their presence, and quite recently I removed a considerable number of concretions from the gall-bladder of a patient who was suffering from cancer of the pylorus, who only dated her first attack to three weeks previously; yet her calculi must have been present for years.

It is probable that as long as the gall-stones remain in the gall-bladder and are not forced into the ducts, there may be an absence of symptoms, but as soon as the concretions pass into the cystic or common duct they produce, as a rule, a definite train of symptoms which

will continue with exacerbations until either the gall-stone passes on into the bowel, through the common duct or by ulceration, or until one or other of the complications, mentioned later, ensues.

If, then, we have repeated attacks of "spasms" without jaundice we may expect to find gall-stones in the cystic duct. If after each attack of "spasms" there be slight jaundice, lasting only for a day or two, and then gall-stones be found in the motions, the probability is that the calculi are small and may pass *per vias naturales*, although, if the attacks are frequent, the patient may become exhausted during the process and it may be necessary to interfere surgically.

If, after gall-stones have been passed, the attacks of "spasms" are repeated and yet no further concretions are found in the motions, the probability is that one or more larger gall-stones remain in the gall-bladder, or may have become impacted in the cystic duct.

If after the attacks the patient becomes jaundiced, the possibility of the impact of a gall-stone in the common duct may have to be avoided, but of this more anon, when we come to speak of diagnosis, as the presence of persistent jaundice is always suspicious of malignant disease.

4. The symptoms commonly met with are :

(a) Paroxysmal pain. For the most part the patient complains of pain under the right costal margin, the pain radiating thence over the abdomen and to the right shoulder, but in one of my cases operated on lately, the pain radiated to the left shoulder. These attacks come on suddenly when the patient is apparently quite well, and usually end by causing vomiting or a feeling of sickness. The vomiting leads to relaxation of the duct, and if the gall-stone be small, it may pass on and thus end the attack. You can easily understand, however, that, supposing the gall-bladder to be crowded with calculi, as in the last case you saw me operate on, in which I removed thirty-eight stones, and if the patient has to undergo thirty-eight or even more attacks (for very frequently one stone will produce several attacks before it passes), it becomes a very dangerous ordeal for the patient, especially when it is borne in mind that the acute, agonizing pain may itself prove fatal, as in a case I saw with a medical man a little time ago, when I diagnosticated gall-stones and recommended operation, which was, however, declined. The next attack of pain unfortunately proved fatal, and at the autopsy a gall-stone was found half extruded into the duodenum. Not only may the agonizing pain of one attack prove fatal, but repeated attacks of pain occurring one after the other without time between to fully recover, may produce death by exhaustion. Within

the last few weeks I operated on a lady in a neighboring county, removing three gall-stones, where the attack had been so severe, and the patient was so weak from pain and vomiting, that I feared she could scarcely bear the operation which I had gone a considerable distance to perform. Fortunately, however, I operated, and she is, I believe, now quite well.

(b) Vomiting, as a rule, paroxysmal, but sometimes, as in the last case, continuous.

(c) Collapse if the pain be severe.

(d) The formation of a tumor in the region of the gall-bladder.

The gall-bladder enlarges downward and forward, in a line which, drawn from the tenth costal cartilage, crosses the middle line a little below the umbilicus. At times there may be a difficulty in diagnosing the nature of a tumor in this region, and not long since, in one of the journals, a case was reported where a surgeon thought he was operating on the kidney, and opened the gall-bladder in the loin; so that occasionally a real difficulty in diagnosis does occur, but if the method of distending the colon with air or carbonic acid, through the rectum, as suggested by Ziemssen, be adopted, it will be found that if the swelling be the kidney it will be pushed farther into the loin, but if the gall-bladder it will be pushed forward. Distention of the gall-bladder without jaundice indicates either stricture of the cystic duct or gall-stone impacted in the cystic duct. Tumor with jaundice has in all the cases which I have observed, and in three cases in which I have operated, turned out to be dependent on cancer either of the duct or of the head of the pancreas.

I am therefore usually averse to operating on cases of distended gall-bladder with jaundice.

(e) The presence of gall-stones in the motions after an attack is valuable evidence, but their absence does not negative cholelithiasis, and I have now operated on a number of cases, and found gall-stones where none had ever been detected in the motions, although diligently sought for. The way to search for gall-stones is to let the patient pass the motion into a solution of carbolic acid, to have it stirred well round, and then to pass it through a fine sieve, say with about one-twelfth-inch mesh.

(f) Jaundice. As long as the gall-stones are in the gall-bladder or cystic duct there is nothing to prevent the bile passing down the common duct into the intestine, but should a calculus become impacted in the common duct, the passage of the bile is obstructed, and jaundice ensues. These are the most difficult cases in which to decide on oper-

ation, for, as a rule, chronic jaundice indicates malignant disease, and not only do patients with malignant disease bear operation badly, but, where jaundice is associated, there is a great tendency to persistent hemorrhage. It happened in my practice two years ago, that I operated on two patients, each of whom had distended gall-bladder associated with malignant disease. In the first case relief was given by the operation, but from the third day oozing of blood occurred from the interior of the gall-bladder and from each suture-puncture, so that in the second week, despite transfusion, the patient succumbed; but in the next case, although one of malignant disease, instead of stopping the bleeding by pressure-forceps, I applied ligatures to every bleeding point, and in this case had no trouble. This might be a mere coincidence, but I have thought it worth bearing in mind since, and in operating in the presence of jaundice I prefer ligatures to pressure-forceps.

A very interesting and important paper by Dr. W. Osler, of Baltimore, on "the symptoms of chronic obstruction of the common bile-duct by gall-stones," appeared in the *Annals of Surgery* for March, 1890, in which he says that the combination of the following symptoms is characteristic of the existence of gall-stones in the common duct, and is therefore of value in distinguishing between that form of obstruction and the one due to malignant tumor.

(1) Jaundice of varying intensities, deepening after each paroxysm, and which may persist for months or even years.

(2) Ague-like paroxysms, characterized by chill, fever, and sweating; after which the jaundice usually becomes more intense.

(3) At the time of the paroxysm, pains in the region of the liver with epigastric disturbance.

This is fully borne out by my experience, and in two cases of jaundice of about two months' duration in patients of the respective ages of thirty and thirty-four, where there was this combination of symptoms, I operated and found gall-stones impacted in the common duct. I succeeded in crushing them and passing the fragments on into the bowel. One of the patients at present in the hospital, suffering from jaundice of several weeks' duration which was preceded by paroxysmal attacks of pain, has been found to be suffering from hydatid tumor, but there is just a possibility that in this case gall-stones may have coexisted with the tumor.

5. How does nature strive to get rid of them?

Ordinarily the gall-stones, being small, are capable of passing along the ducts into the intestine, whence they pass away with the motion,

but if a number of the concretions become crowded in the cystic duct or in the gall-bladder, they may produce so much irritation as to set up peritonitis in their vicinity, and the gall-stones ulcerating their way may become evacuated into the duodenum or into the colon. This is the only mode by which any of these large concretions which I show you could have been got rid of, unless by operation, and in a case which I saw in private some time ago, a lady, after a very severe illness, with manifest signs of peritonitis in the right hypochondrium, was seized with symptoms of intestinal obstruction which were relieved by the passage of a large gall-stone more than an inch in length. This is not an uncommon occurrence, and in No. 9 Ward is a patient now recovering from an attack of this kind where I had to open the abdomen in order to treat the intestinal obstruction. You can also see in No. 9 another case where nature was attempting to get rid of the gall-stones by the formation of an abscess between the liver and gall-bladder, and when the patient was seen by me, she was so ill that I had to operate under very unfavorable circumstances. The patient is now recovering, and you will remember that I removed nearly forty gall-stones from the interior of the abscess, which appeared to be bounded by intestine, stomach, gall-bladder, and liver. Sometimes the patient's strength is sufficient to allow of the abscess reaching the surface and thus to permit of the evacuation of the concretions without extraneous aid, but this is so rare that it cannot be calculated on.

6. What are the dangers resulting from gall-stones?

(a) Exhaustion from repeated attacks.

(b) Fatal collapse from acute pain. I have already mentioned to you a case which came under my own observation.

(c) Fatal jaundice, which is not infrequent, and a good example of which is given in a case reported in the *Lancet*, May 28, 1887, by Dr. Glover Williams. I also saw a case last year in which intense jaundice of three months' duration in a young woman set up fatal cerebral hemorrhage, and at the autopsy the common and cystic ducts and the gall-bladder were crowded with gall-stones eighty in number.

(d) Dropsy of the gall-bladder, which in some cases has attained to so large a size as to have been mistaken for an ovarian tumor and operated upon as such. Moreover, this condition is not unattended with danger, as shown by several cases of fatal peritonitis due to rupture of a distended gall-bladder.

(e) Empyema of the gall-bladder, as in Case 3, where I operated and emptied the gall-bladder of eight ounces of pus, stitching the gall-bladder to the surface and draining it.

(f) Perforation of the gall-bladder or ducts leading to a rapidly-fatal form of peritonitis. An instance of this, which very much impressed me, came under my notice long before I had done my first cholecystotomy, where I had diagnosticated gall-stones and where the patient was seized with a sudden severe pain rapidly followed by collapse and death, caused by a gall-stone which had by a process of ulceration perforated the duct.

(g) Abscess of the liver, as in Case 4, and an example of which you can now see in one of my wards.

(h) Peritonitis. Local peritonitis is frequently associated with gall-stones, and in very few cases in which I have operated have I found the parts free from adhesions, proving the existence of peritonitis during one or more of the attacks. In one case, where the stomach and colon were adherent to the under surface of the liver, the separation of the adhesion seemed to have quite as much to do with the cure of the patient as the removal of the calculi. This is probably the explanation of the benefit derived from operation in the case just discharged cured from No. 3 Ward.

(i) Septicæmia, which may occur either as the result of ulceration or from decomposition in an abscess.

(j) Intestinal obstruction, which is for the most part brought about by a large gall-stone having ulcerated its way into the bowel, and then having become impacted in some part of the small intestine, as in a case already mentioned.

(k) Hemorrhage. When a gall-stone becomes impacted in the common duct and produces intense jaundice, a change occurs in the blood which prevents its coagulation naturally, and thus it is not uncommon to find bleeding from the nose and stomach, and in one case which I saw last year this was apparently the cause of a cerebral hemorrhage. Moreover, this tendency to hemorrhage is one of the most dangerous complications in the operation of cholecystotomy.

7. The only medical treatment which seems to be of any use is the administration of Carlsbad water, which is best given combined with a little hot water the first thing in the morning before breakfast, it being essential that the diet should be regulated, rich and fatty food being, as far as possible, avoided, and strict temperance in stimulants enjoined. Regular exercise and the avoidance of tight lacing should be insisted on; in fact, one of the reputed causes of the greater frequency of gall-stones in women has been said to be their mode of dress. During the attacks the pain must be relieved by sedatives, of which the subcutaneous injection of morphine is the most satisfactory. Hot fomenta-

tions over the abdomen and the drinking of hot water often give relief. Large doses of olive oil are said to favor the expulsion of gall-stones. I have never found it to be of the slightest service, and Dr. Kishkin, in a paper in the *Meditinskoe Obozrenie*, and quoted in the *Lancet*, 1889, vol. ii. p. 710, shows clearly how the mistaken idea of its benefit has arisen. The supposed calculi, which were parted with, were found to consist of oleic, palmitic, and margaric acids, with lime soap, and similar concretions could be produced at any time by giving olive oil to any person suffering from scanty biliary secretion, no true gall-stones ever being found in the motions after the olive-oil treatment. Ether, chloroform, belladonna, and other medical means are all nearly futile. Massage finds a strong advocate in Dr. George Harley, F.R.S., who in a communication to the *Medical Annual* for 1890, says, speaking of massage, "For without doubt perseverance and opportunity will, in the end, enable them (the operators) to discover gall-bladders equally as readily as the trained fingers of the expert do; and that too even through abdominal parietes so thick that untrained hands cannot so much as make out the boundary of the solid liver through them. While, again, they will ultimately find that they will be able to extrude small impacted biliary concretions, be they in the shape of sand, gravel, or stones, from the bile-duct into the duodenum with as much certainty and safety as they can pass a catheter through a stricture into a human urinary bladder. At the same time, for the sake of the patient's welfare as well as their own reputation, they must never forget to be as careful in the mode of operative procedure in the one case as in the other, as neither operation is invariably unattended with danger. This is especially the case when the manipulative operation has been unfortunately delayed until the gall-stones have grown large and hard, and, on account of prolonged pressure, begun to ulcerate through the tissue they have long pressed against."

I need scarcely add more than to draw your attention to the numerous specimens which I am able to show you, and to ask you whether it is likely that any of these could have been forced by any amount of rubbing through the narrow passages which we know the cystic and common ducts to be. Only a few weeks ago I was called to a distance to operate on a lady who had been under this treatment, judiciously and systematically carried out, and who had nearly died under the process, so that I had to operate on her in a much more unfavorable condition than would otherwise have been the case. I was, however, fortunately able to remove the gall-stones, and the patient is now well. I can only say that if I had gall-stones I would not have massage

done, and if I should be consulted on the matter, I could not conscientiously recommend any one to try it, as although it may possibly aid in the expulsion of very small calculi, it is impossible to diagnose the absence of large ones, and to know the exact condition of the ducts which may possibly be ruptured by manipulation.

It will thus be seen that the so-called medical treatment offers but small chance of cure in these cases, and that when once the gall-stones have attained to any size or are present in considerable numbers and are producing symptoms, the only rational mode of treatment is by operation.

What then are the indications for surgical treatment in cholelithiasis?

(a) In cases of repeated attacks of biliary colic, apparently due to gall-stones, which, not yielding to medical treatment, are wearing out the patient's strength.

(b) In perforation from ulceration.

(c) Where there is evidence of suppuration in the neighborhood of the gall-bladder set up by gall-stones.

(d) In empyema of the gall-bladder, which is usually accompanied by peritonitis.

(e) In dropsy of the gall-bladder.

(f) In obstructive jaundice, when there is reason to think that the common duct is occluded by gall-stones; but it must be borne in mind that jaundice adds very materially to the risk of the operation.

The operations which you have seen me perform on the gall-bladder are cholecystotomy, cholelithotripsy, cholecystectomy, and cholecystenterostomy. Cholecystotomy, in the presence of a distended gall-bladder, is one of the simplest of operations, as all that it is necessary to do is to make an incision over the tumor in the right linea semilunaris to empty the gall-bladder by aspiration, when emptied, to open it by a small incision in its fundus, and then by means of forceps to remove the gall-stones.

But should the gall-stones be impacted in the cystic duct, as is usual, and as was the case in the patients from whom I removed specimens Nos. 1 and 2, it may be necessary to pass the fingers to the under surface of the liver so as to press the gall-stones towards the gall-bladder, assistance being rendered by the forceps within. If the gall-stones cannot be dislodged, it is necessary either to crush them by means of guarded forceps placed outside the ducts, or to break them up by means of needles pushed into their substance. In one case Dr. Taylor was unable to dislodge a gall-stone from the cystic duct, but

succeeded by syringing with hot water in securing the expulsion of the gall-stone some days subsequently. If the gall-stones be impacted in the common duct, it will be necessary to crush them either between the finger and thumb as you saw me do in a patient now in No. 9 Ward, or they must be crushed by guarded forceps, which I have done on several occasions.

Mr. Thornton proposes in these cases to incise the common duct, extract the stone, and suture the opening.

After the gall-stones have been removed in whatever way, the gall-bladder, if it has been distended, is usually stitched to the margin of the external wound, the remainder of the parietal wound being closed in the usual way. But should the gall-bladder be contracted or adherent to surrounding parts, or placed deeply under cover of the liver, the operation is not by any means so simple, and this is often the case where there have been repeated attacks of "spasms" without the passage of any gall-stones in the motions.

After separating the adhesions, if such be present, the gall-bladder is opened, all gall-stones are removed, and a drainage-tube is inserted through the incision into the gall-bladder. If the edge of the gall-bladder cannot be made to reach the parietal peritoneum, the latter can often be tucked down and sutured to the gall-bladder; but in three cases I found this to be impossible, and in two of these I brought up the right edge of the omentum, suturing it to the margin of the gall-bladder and to the parietal peritoneum, thus shutting out the general peritoneal cavity, while in the other case, where the gall-bladder was so destroyed by suppuration and the parts were so matted that it was impossible to get at any definite anatomical structure, I simply washed out with hot water and left in a rubber drainage-tube. It must be borne in mind that in all these cases strict antiseptic precautions are observed.

Lithotrity.—On one of the patients, now in No. 9 Ward, I performed the operation which might be truly termed lithotrity; in that, after opening the abdomen, I found the gall-bladder and cystic duct perfectly free from calculi, but in the common duct I could feel a stone apparently about the size of a cherry. This I succeeded in crushing between the finger and thumb after having failed to grasp it between forceps. The gall-bladder was not opened and the abdomen was closed. The patient has recovered without a bad symptom, and the jaundice from which she had been suffering for several weeks has now, as you can see, quite disappeared.

Cholecystectomy is performed by separating the gall-bladder from the liver, and dividing the cystic duct between two ligatures, the proxi-

mal end of the duct being secured, if possible, by one or two Lembert sutures, the area of operation being isolated by sponges, as should be done in all operations on the gall-bladder. It may be necessary to perform cholecystectomy in contracted gall-bladder which cannot be sutured to the parietes, or on the occurrence of perforation from ulceration, or in empyema where the tissues are thin and unable to bear suture ; but it may also have to be performed for the persistence of the fistula, as in my second case, where in consequence of the stricture of the cystic duct a mucous fistula persisted, and in Case 6, from which I removed sixty-six gall-stones in August, 1888, after which the patient returned to her home with the wound perfectly healed, but where a fistula ultimately formed and discharged a little mucous fluid. Some of you saw, a little time ago, this patient operated upon, because whenever the fistula closed she had pain. I therefore reopened the abdomen and, finding a stricture of the cystic duct, removed the gall-bladder. The patient returned to her home within the month and is now perfectly well.

Cholecystenterostomy was first performed by Winiwater for chronic jaundice where he was unable to remove the obstructing cause, and it had not been done in England until I performed it in March, 1889, for biliary fistula, which I believe is the only instance of a biliary fistula having been cured by cholecystenterostomy. The patient on whom this operation was performed was the third of my cases of cholecystotomy, where the operation had been performed for empyema of the gall-bladder, which was followed by a biliary fistula. The patient is now in perfect health and is following the occupation of a nurse. It has been proposed to perform cholecystenterostomy in cases of obstruction of the common bile-duct, but you will see, from what I have said in speaking of cholecystotomy, that whenever one can clear the common bile-duct by crushing and removing the stone, that should be done.

You will see, gentlemen, by the view I have taken of the subject, that I have very little faith in the ordinary medical means of treating cholelithiasis, and I believe that by far the greater number of patients who are suffering from repeated attacks of so-called "spasms" are in reality suffering from gall-stones and can therefore be relieved if their symptoms are so severe as to require active interference.

Bearing in mind the numerous dangers of cholelithiasis, and knowing with what little risk cholecystotomy can be performed, I have no hesitation in recommending operation whenever there are repeated attacks of biliary colic, apparently due to gall-stones, which do not yield to a definite course of medical treatment, not necessarily very prolonged.

Gynæcology and Obstetrics.

THE EARLY DIAGNOSIS OF PREGNANCY.

CLINICAL LECTURE DELIVERED AT THE BUFFALO GENERAL HOSPITAL.

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GENTLEMEN,—This patient came into the hospital the other day with an indefinite history. She is twenty-six years old; has been well until three weeks ago, when she began to suffer from backache, pain in the stomach nausea, and vomiting, worse in the morning. Her periods have always been regular though painful, but she has not been unwell for the last two months. She has daily movements of the bowels, but the passages are small, hard, and dry.

We would naturally suspect, from the history, that the woman might be pregnant. She is unmarried, which is a point against it, but is not conclusive. The signs and symptoms of pregnancy at the end of the second month are often very far from being distinct, and we cannot always make a diagnosis at this early period. We certainly cannot do so from the subjective symptoms, and it is only after a careful examination of the pelvic organs that we can tell whether the woman is probably pregnant or not. We cannot even then always express a positive opinion. It would not do to accuse an unmarried woman of pregnancy from anything that we can find at the end of the second month. It is better to watch such a case carefully and reserve our diagnosis, meanwhile gaining the confidence of the patient. Later, when the diagnosis can be made with absolute certainty, there is no objection to asserting one's self positively.

The breast symptoms will help us to a certain extent, but in the second month they are not well marked. The breasts of this patient are not very large, but they seem to be a little more nodular than normal, and have not the perfectly homogeneous consistency which the breasts should have in the non-pregnant condition. The areola is a little darkened, although the patient is not a brunette. The nipple

stands up very readily,—that is, it is erectile,—a point in favor of pregnancy. On the surface there are little scales due to the drying of the secretion from the nipple. This is not very marked, but it lends probability to the diagnosis. On milking the nipple we fail to get any secretion; at this early date, however, we would not expect to find any fluid, though it occasionally exists. The breast-signs, we may say then, are certainly not opposed to pregnancy, and are in favor of it as much as we should expect at the end of the second month.

The examination of the abdomen comes next. Its walls are not very thick, and by simply pressing on the left side just above the pelvic brim I feel nothing abnormal. In the median line I feel a slight sense of resistance, but cannot make out anything very definite, and it may be merely a contraction of the recti muscles. In the right iliac region there is a distinct tumor. The deposit of pigment in the *linea alba* is, you will notice, very distinct, much more so than it should be in a non-pregnant woman of her complexion.

What can this tumor on the right side be? We suspect pregnancy: can the tumor be the uterus? It would make us think at once of extra-uterine pregnancy, and by simply palpating the abdomen we cannot tell whether it is the displaced uterus, an extra-uterine pregnancy, or something else. We must therefore make a vaginal examination. The hymen is ruptured, and I can easily introduce three fingers into the vagina. The vaginal wall is soft and relaxed, though not to a very great degree. The middle of the cervix is a little to the right of the median line. Passing my fingers around the cervix, I find that the left lateral fornix is quite full, the fulness being due to a body which is continuous with the uterus. I can also feel the uterus in front, to the other side, and behind, which I could not do if the uterus were not large. The rectum is full of hard fecal matter. The woman states that she has had a movement of the bowels every day, but, because the movements were hard, I directed a laxative for her. In spite of this, more fecal matter has passed down into the rectum than has left it, and there is this impaction which will require more than one cathartic to clear it out.

How can I be sure that the tumor which I feel on the outside by palpating the abdomen and the tumor to the right of the cervix are one and the same thing? By that invaluable method of conjoined or combined manipulation. Without this method we cannot make a diagnosis in this case. Those who are not accustomed to this method will scarcely believe the advantage it gives one. No exploration of the pelvis can be said to be complete without its employment. It has

done more to advance the practice of gynæcology than any other one invention of modern times. I have seen no end of mistakes made by neglecting it,—large ovarian and fibroid tumors overlooked, diseases of the tubes and ovaries not suspected, and other blunders of this kind. Its employment also does away to a large degree with the necessity for the use of the sound, thus greatly lessening the risks of an examination.

In this case much might be learned by the passage of the sound as to the size and position of the uterus, but this would be manifestly improper, and the same results can be obtained by bi-manual examination. Do not fail to accustom yourselves to its habitual employment; you will thus become expert and save yourselves from many mistakes.

I use my left hand in the vagina, so as to leave the stronger and better hand for use externally. I find that the mass which I felt in the right iliac fossa and the cervix are undoubtedly connected. I can feel the body of the uterus between my hand on the outside and my finger in the vagina. The uterus is somewhat anteflexed and considerably enlarged.

Thus I think that we have made a diagnosis of pregnancy as positively as can be made at this early period. We have found the symptoms and signs of early pregnancy. We find an enlarged uterus in a perfectly-healthy woman who is too young to have fibroids. The perfectly justifiable conclusion is that she is pregnant.

How shall we account for the displacement of the uterus? I think we can account for it by the large accumulation of fecal matter in the rectum, which is on the left side of the pelvis. The constipation has been overlooked because the bowels have moved a little every day. It may be that, after the bowel has been emptied by more than one dose of pretty active physic, the uterus will go over to the median line; or perhaps the ligaments may have become stretched to a certain extent by the malposition of the uterus, and so it may remain a little to one side until it gets larger.

I have had a good many cases brought to me with the diagnosis of extra-uterine pregnancy, the only reason for the diagnosis being that the tumor was on one side. The practitioners did not seem to realize that the pregnant uterus might be pushed to one side. I was sent for not long since to go two hundred miles to see what was supposed to be a case of extra-uterine pregnancy. On my arrival I found it to be nothing but a case of this kind. The woman was confined normally afterwards and delivered of a healthy child. The doctor was a most admirable practitioner, but he got the idea into his head that he had a

case of extra-uterine pregnancy and made the symptoms conform to his preconceived idea. I do not think this matter of lateral displacement of the pregnant uterus by fæcal accumulation and other causes is sufficiently dwelt upon in the text-books. Experts make the diagnosis without thinking much about it, and a physician of less experience, on meeting such a case, is apt to make the mistake of thinking that he has an extra-uterine pregnancy.

ELEVATION OF TEMPERATURE DURING THE PUERPERAL PERIOD.

CLINICAL LECTURE DELIVERED AT THE MONTREAL MATERNITY HOSPITAL.

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WE are living in an age of great scientific activity and progress ; hosts of workers in the laboratory and at the bedside, with microscope, test-tube, and instruments of precision, are trying, testing, and proving. Old doctrines and beliefs venerable with the traditions and authority of ages are being widely overthrown, old methods revised, and everything brought to the crucial test of observation and experiment. Meanwhile, the general professional mind is kept in a state of unrest, sometimes even of positive bewilderment. It is well, therefore, once in a while, to cry a halt and review the field, count up our gains and losses, note what is being done in other departments, see how it tallies with our own results, correlate the new knowledge with the old and estimate its influence upon our beliefs and practice. Clear ideas respecting the etiology of disease are an essential preliminary to its rational treatment. In no department of obstetrics do we find greater haziness among our professional brethren than with regard to the causes of fever during the puerperal state, and nowhere do we find treatment more apt to be empirical, sometimes timorous and procrastinating, sometimes rash and injudicious.

Before we consider what is abnormal and pathological, let us make sure that we know what is normal and physiological. During gestation the temperature is usually the same as in the healthy non-pregnant state. The temperature is normal at the beginning of labor, but rises as labor progresses. It rises higher in primiparæ than in multiparæ, higher in difficult and protracted than in short and easy labors, higher when the second stage is difficult and prolonged.

Temperature of the First Day.—After the conclusion of labor the temperature rises steadily and then falls. Broadly speaking, it may be said that in primiparæ there is (1) a rise during the first twelve hours,

and (2) a fall during the second twelve hours. It rises higher in primiparæ than in multiparæ, higher after irregular than after regular labors, and the higher it rises the longer it takes to reach the minimum. In multiparæ it reaches its maximum in six to seven hours, and then falls uninterruptedly for ten or twelve hours, so that we find usually the maximum is reached in six or seven hours after birth, the minimum in from sixteen to nineteen hours after birth. This rise and fall of temperature after labor is modified by the usual diurnal rise and fall (*i.e.*, rise during the day and fall during the night), so that the actual temperature of any given case is really the resultant of these two temperature curves. It is evident, therefore, that the temperature of the first day hinges upon the time of day when labor terminated. If the twelve-hour rise which follows labor coincides in point of time with the normal daily rise, the temperature may run up to 100° F. or even 101° F., but if it is met and counterbalanced, so to speak, by the daily physiological ebb, there may be little or no observable elevation of temperature. In births between 5 A.M. and 2 P.M. the rise is most marked (in births at 2 P.M. 101.4° F. has been observed by 5 P.M., the minimum not being reached till next morning); in births between 6 P.M. and 4 A.M. the rise is slight. In a general way it may be said that births during the night are generally followed by little or no rise, those during the day by a marked rise. The normal limits of temperature during the first day may be set down as 98.5° to 100.5° F.

From the second to the eighth day the temperature follows the ordinary physiological course, differing but little from day to day. It is important, however, to remember that there is a difference of from 1.2° to 1.4° between the maximum and minimum of each day; this must be taken into account when estimating the significance of any given temperature. The course of daily temperature is as follows: it rises from 4 A.M. to 10 A.M., remains tolerably constant (with slight rise after meals) till 6 P.M., then falls steadily till midnight, and remains at the minimum till 4 A.M., when it begins to rise once more; the maximum temperature is at 10 A.M., the minimum temperature at midnight, the average temperature at 6 A.M. and 8 P.M.

If the average temperature of the day is required, it should be taken at 6 A.M. and 8 P.M., or allowance made if taken at other times. If greater accuracy is required, and four daily observations can be taken, they should be at 2 and 8 A.M. and at 2 and 10 P.M., and the following formula generally holds good:

$$\frac{8 \text{ A.M. and } 10 \text{ P.M.}}{2} = \frac{2 \text{ A.M. and } 2 \text{ P.M.}}{2}.$$

The chief points respecting the normal temperature may be summarized as follows :

1. The temperature of a healthy pregnant woman is the same as in the healthy non-pregnant state.

2. Labor raises the temperature, the amount of rise depending upon the length and severity of the labor, particularly of the second stage. The rise is greater in primiparæ than in multiparæ, greater in irregular than in regular labors.

3. In the first day the temperature rises continuously till it reaches the maximum and then falls continuously till it reaches the minimum. The height to which it attains depends chiefly upon the time of day when labor terminates, the rise being greatest in those concluding during the day.

4. From the second to the eighth day, there is a variation of less than 0.5° in the average temperature from day to day ; but there is a difference of from 1.2° to 2.4° between the maximum and minimum each day. The maximum is observed at 10 A.M., the minimum at midnight, the average at 6 A.M. and 8 P.M.

While the temperature rises immediately after labor, the pulse begins to fall and keeps falling steadily for eight days, at the end of which time it is nine to ten beats slower than at the conclusion of labor. This slowing down is equally well marked in multiparæ and primiparæ. Like the temperature, the pulse shows a diurnal variation, which is seventeen on the average. The pulse is slowest at midnight, quickest at 8 A.M., and rises after meals like the temperature.

From the observation of two thousand consecutive cases in the *Marburg Klinik*, Ahlfeld found that 68.8 per cent. recovered without rise of temperature beyond normal limits. In the *Innsbruck Klinik* only 6.1 per cent. (and during vacation 6 per cent.) rose above normal. In four hundred and twenty-seven women who had not been examined or handled during labor, Leopold found that only 1.6 per cent. had rise of temperature during the puerperium. Mermaun had rise of temperature in only 6 per cent. of his last two hundred cases. There is no good reason why the results in private practice should not be at least as good as those in hospitals where clinical instruction is being given to students and midwives, necessitating much unnecessary handling. We have no exact data by which we can determine what the percentage of morbidity in private practice really is, but undoubtedly it is far higher than it ought to be. Few men use the thermometer as a routine practice in their obstetric work ; yet without systematic thermometric observations statements respecting the presence or absence

of fever after confinement have no scientific value. As some men never have perineal tears in their practice, so others never have fever in their puerperal patients; the explanation is simple,—they never take the trouble to look.

Causes of Fever.—When fever does occur, to what is it attributable? Some men find an all-sufficient cause in so-called *milk-fever*,—for do not the laity accept milk-fever as a good and sufficient reason for almost anything from a cracked nipple to a phlebitis or septic peritonitis, and have not the old-time nurses many a blood-curdling tale to tell of the dire effects of milk, when it goes to the legs, the womb, or the brain. In well-regulated hospitals, where exactness of observation is possible and the surroundings and treatment of patients are under thorough control, it has been proved over and over again that lactation is a physiological process whose establishment is not attended with fever. Occasionally in nervous high-strung women a rapidly-filling breast becomes engorged and tender, and there is a sudden rise of temperature; but in such cases the rise is only temporary, and yields at once to appropriate treatment. In hospital practice, since we have learned to seek the cause of mastitis in the absorption of septic matter through abraded nipples, or in irregular, inefficient, or imprudent nursing, and have adopted preventive measures accordingly, swollen, inflamed breasts with fever are becoming far more uncommon.

A rational treatment of fever must be based upon clear ideas of its etiology. We must away with old myths and grasp the fundamental fact that the normal temperature curve during the puerperal period differs very little from that of health, that lactation is a physiological process normally unattended with fever, and that when febrile symptoms do occur, their explanation must be sought in some pathological condition, not in the establishment of a physiological function.

The causes which produce fever during the puerperium may be divided, for convenience, into (1) infectious, and (2) non-infectious.

1. *Infectious.*—In the great majority of cases fever during the puerperium is the result of *wound-infection*. Living ferments or microbes are introduced from without, through abrasions or lacerations of the genital tract, and produce their effects either directly or indirectly. It is a very common mistake, and one which is very injurious in its influence upon practice, to look upon slight febrile movements as only *ephemeral* fever of no special significance or importance, and to think of septic absorption only when dangerous constitutional symptoms exist. We should try to realize that septic wound-infection may be either *benign* or *malignant*, and may cause symptoms either mild or severe.

In two cases, one mild, the other severe, the morbid agent may be the same, but the difference in the course and severity of the attack lies in the amount or intensity of the poison absorbed and the resisting power of the organism. Experience proves that small-pox, diphtheria, or scarlatina may be so mild as to be scarcely recognizable or so malignant as to kill in a few days. Yet the nature of the poison is the same, and the mild case may infect others with the malignant form. So in like manner cases of septic wound-infection may vary greatly in intensity, though produced by the same poison, and the danger of infection may be as great from the mild as from the severe. If we continue to regard all the mild febrile disturbances as ephemeral fever or milk-fever, and only the severe ones as septic wound-infection, we cannot expect to work out a rational treatment founded upon a scientific basis. In scarlatina epidemics we often notice that the first couple of cases in a ward or family are mild,—the first mutterings of the storm,—then suddenly a child is stricken down with the malignant form. The infective agent, mild at first, seems to concentrate itself and gain intensity and power as it spreads. So in hospital practice we often find that several cases of moderate fever with, perhaps, a little parametritis usually precede the general outbreak. If the true state of matters is realized and the warning heeded, prompt measures may avert disaster. I believe that the same thing holds good in private practice; careful observation would show that there have been moderate febrile symptoms among the patients attended by certain physicians or nurses before the onset of more general trouble in their practice.

How does septic wound-infection occur? Through the numerous traumatismis in the genital tract which result from labor, micro-organisms, chiefly streptococci and staphylococci, either enter the system directly or lodge in clots, shreds of membrane, or fragments of adherent placental tissue; they multiply rapidly, generating poisonous products, which are readily absorbed and cause severe constitutional symptoms. The microbes are brought in contact with the open surfaces by the air or by means of unclean hands, instruments, utensils, clothing, sponges, dressings, etc. Traumatismis, shreds, clots, and placental fragments may all exist in the genital tract without danger to the patient unless and until the infective microbes gain entrance. In a recently-reported case, the placenta remained *in utero* for twenty-five days after an abortion without decomposing or causing any systemic infection. For septic wound-infection, the presence of microbes is essential. But such micro-organisms do not exist normally in the uterus and upper portion of the vagina, nor are they found in the

CHART I.

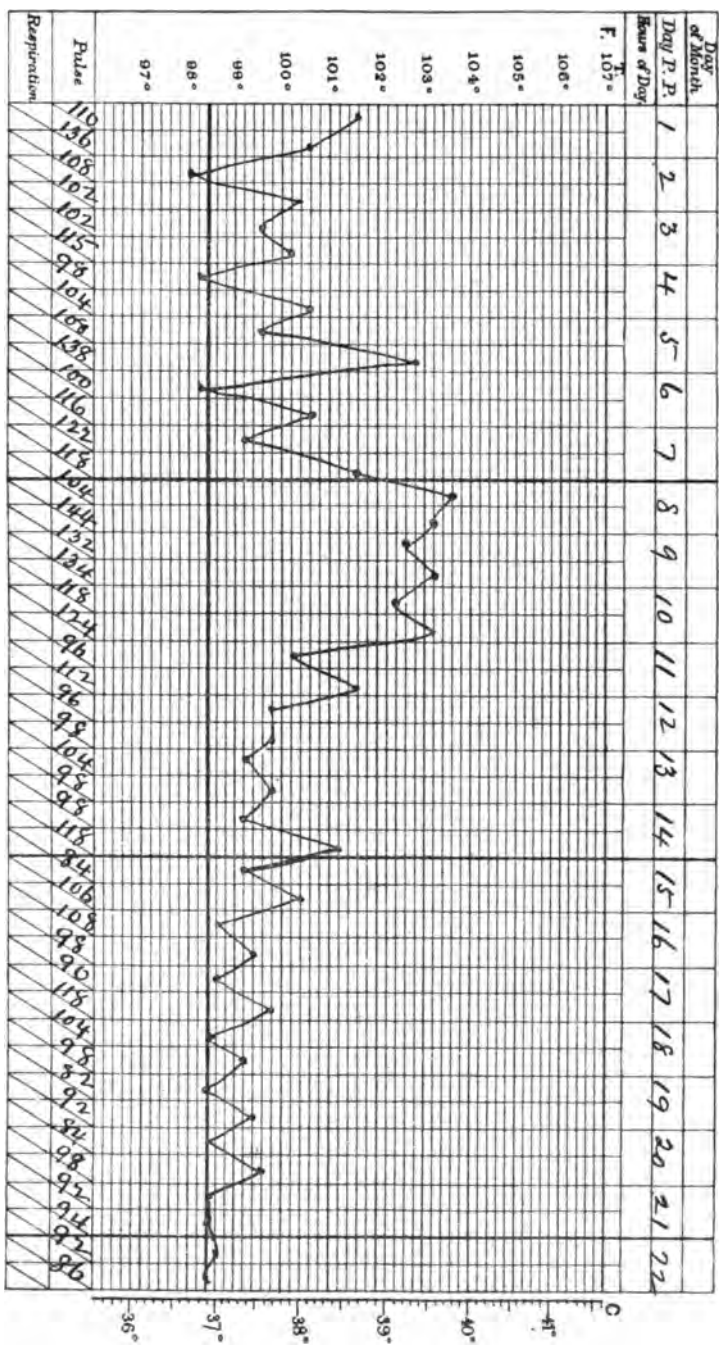


CHART II.

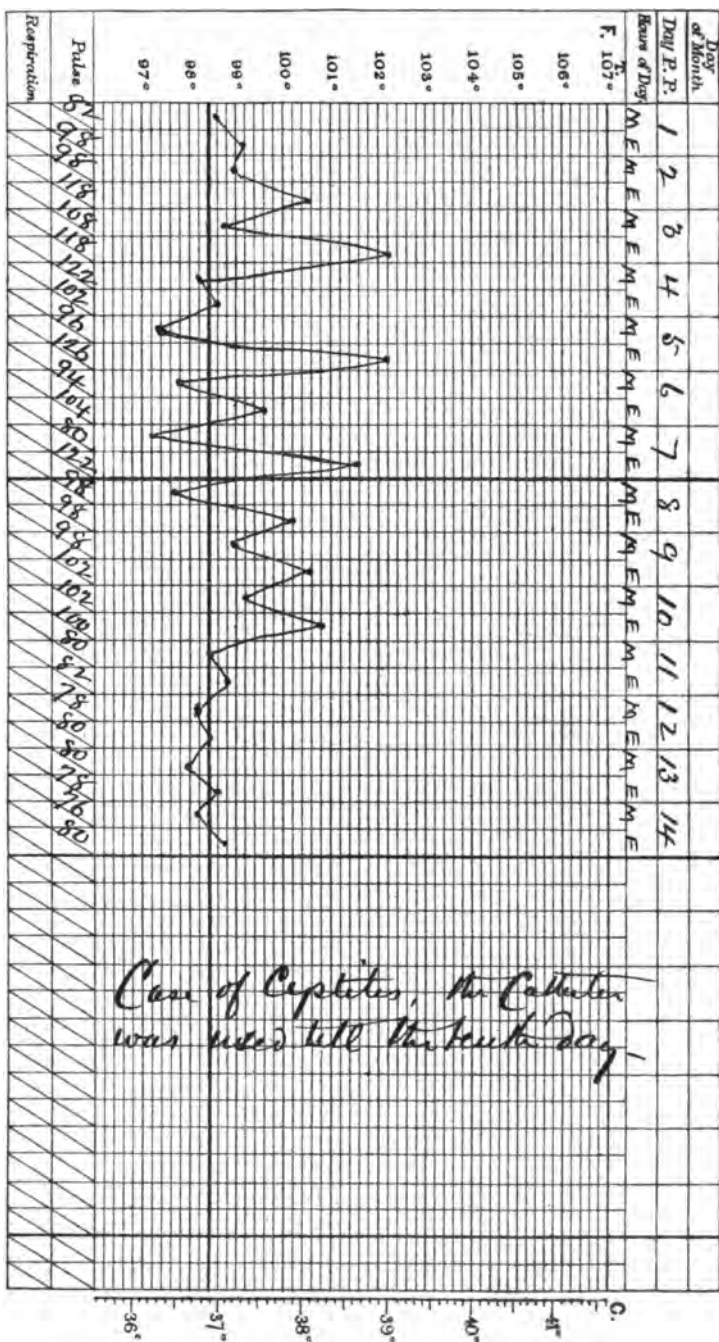


CHART III.

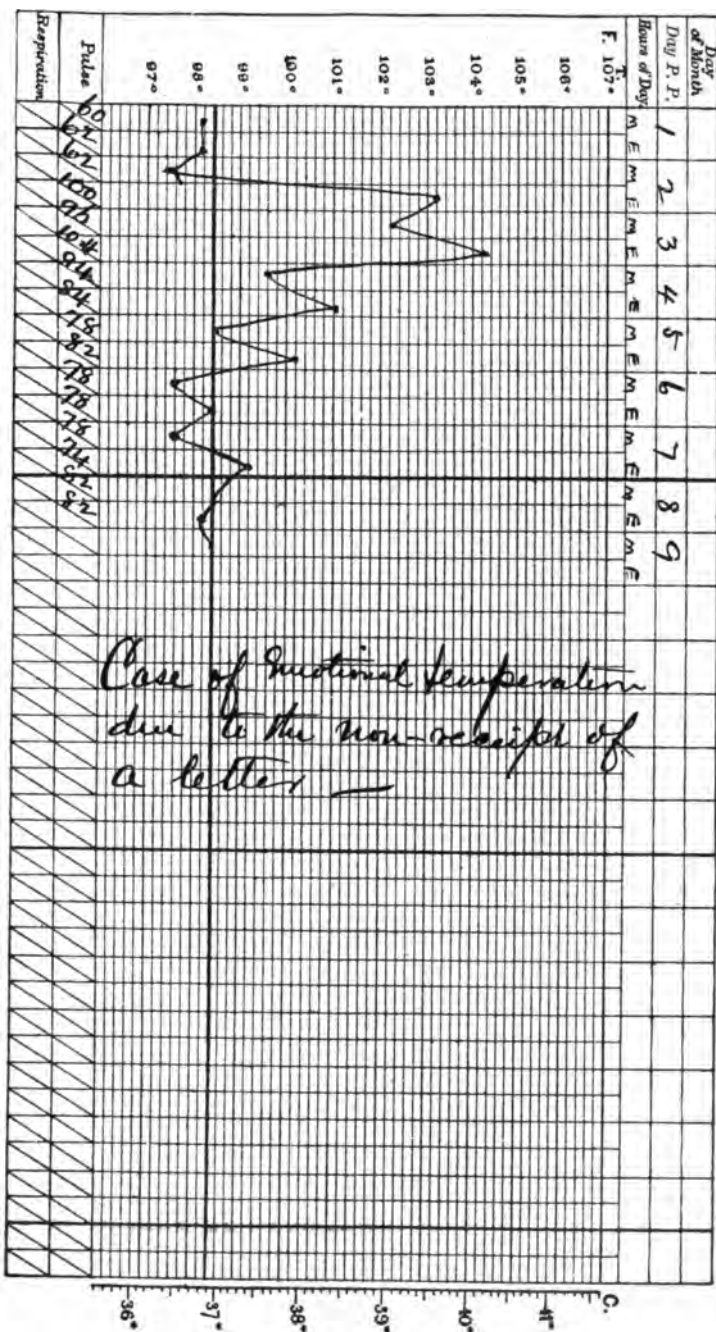
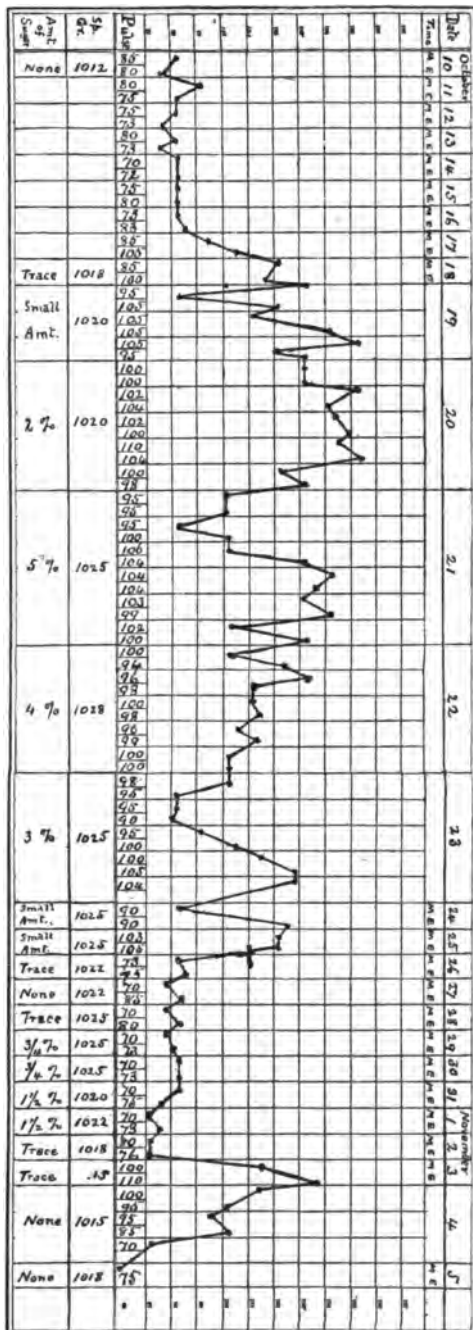


CHART IV.



Name

CHART V.

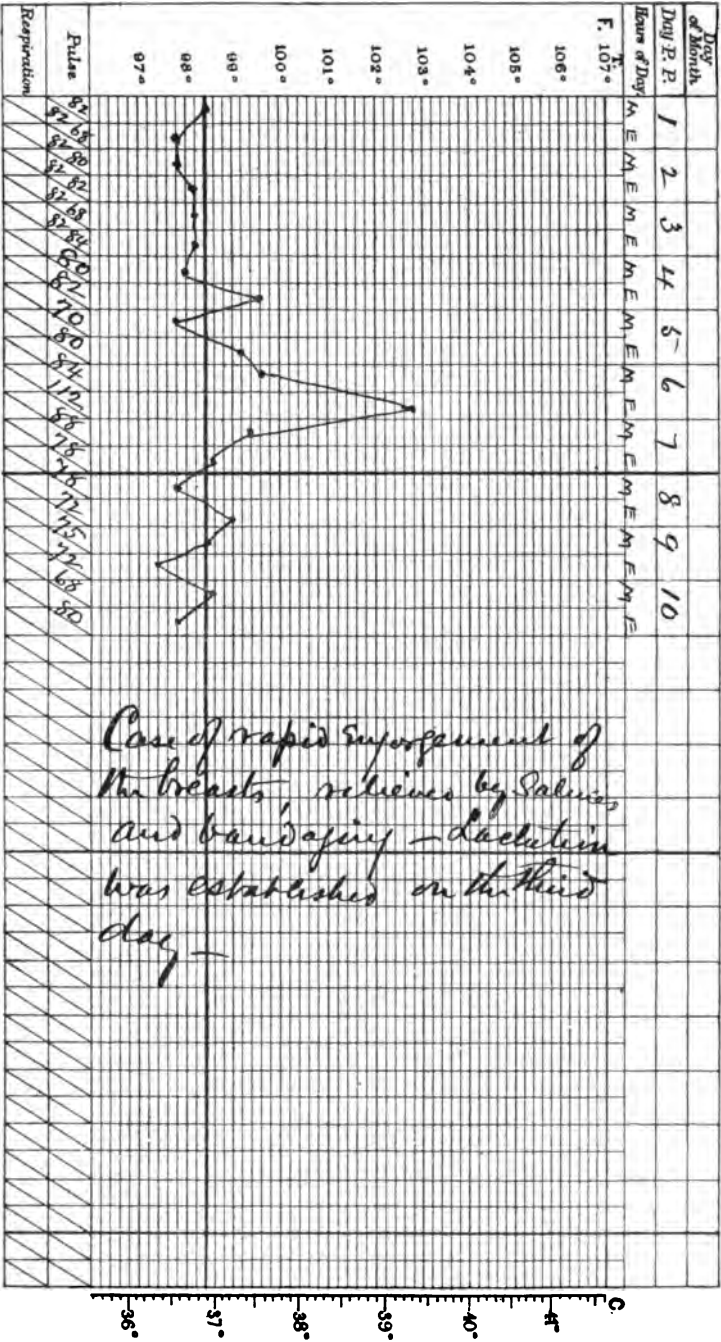


CHART VI.

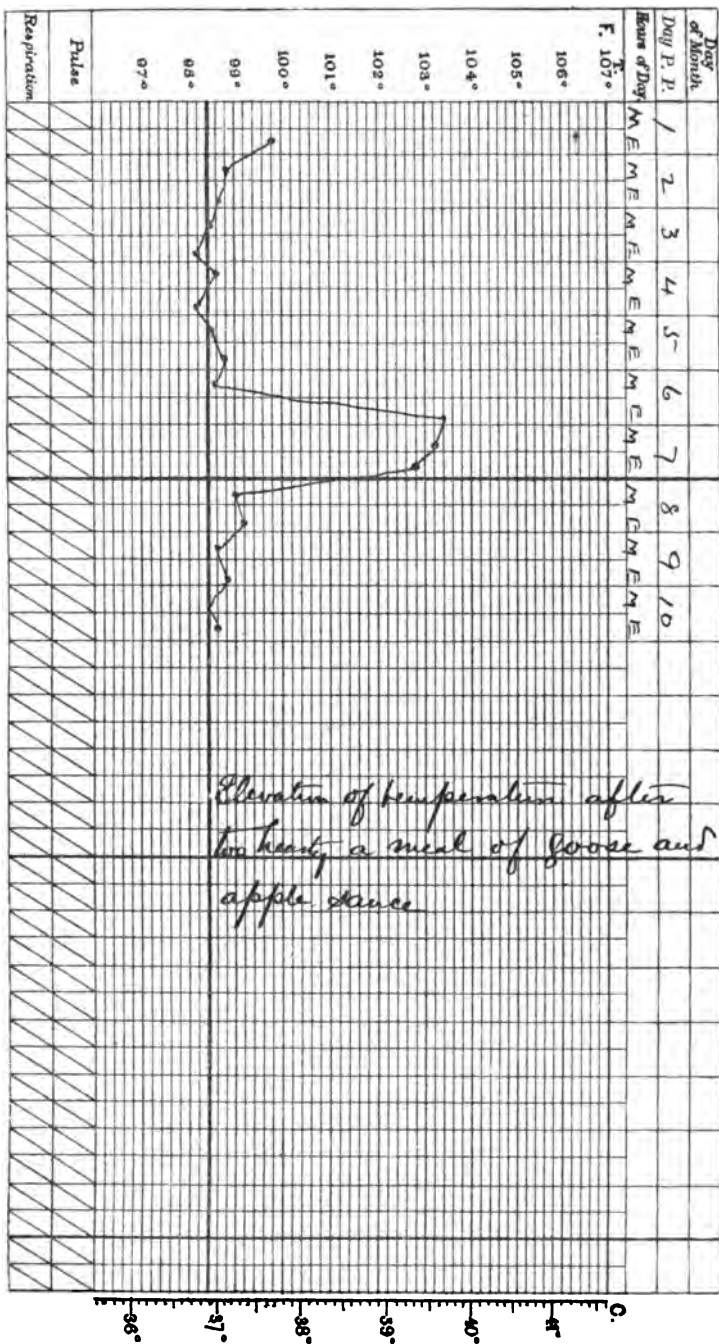
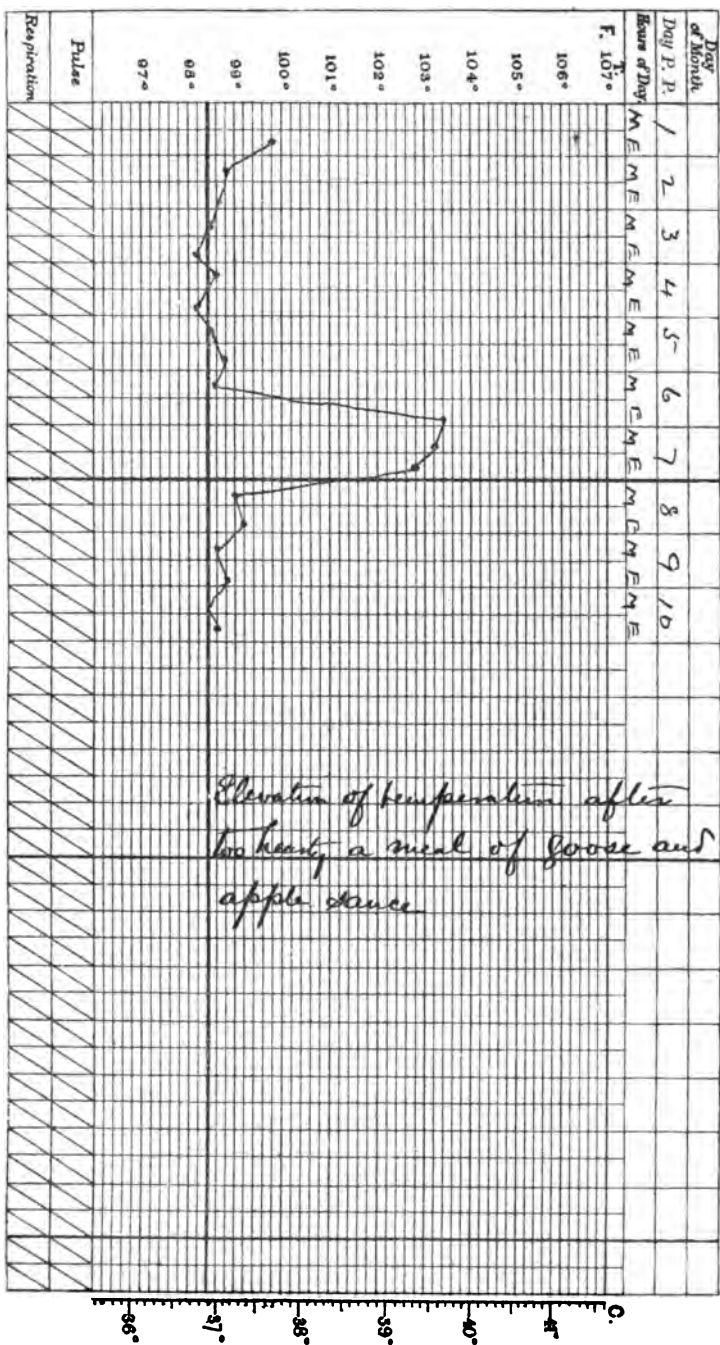


CHART VI.



normal lochial discharge; they must be introduced from without. I have said that they may be carried in the air; but in such a case the air must be in close communication with a foul closet or some such focus from which it derives its infective power. Infective microbes do not appear to be propagated through the ordinary atmosphere. At any rate we cannot excuse ourselves by throwing the blame on the air. It is as much our duty to see that infected air is excluded from the genitals as to see that hands, instruments, and utensils are properly disinfected.¹

There is much useless wordy warfare going on about *auto-infection*, and much confusion arising from different meanings applied to the term. Without going into the question, we may safely say that if auto-infection means spontaneous infection, there is certainly no such thing. We cannot shirk our responsibilities by playing upon words. Puerperal women do not generate septicæmia spontaneously, nor do they get it from the normal atmosphere. They are infected from without, and it is our duty to guard against such infection. Space will permit only a hurried glance at the commonest varieties of septic fever.

Vulvitis and vaginitis, the diphtheritic form being the most serious. Rise of temperature is the first symptom, sometimes preceded by a rigor. It usually begins about the second or third day, sometimes on the first, rarely as late as the sixth or seventh. The temperature generally rises gradually, but occasionally jumps at once to 103° F. or 104° F.; it has no typical curve, but is usually higher at night. (See Chart I.) The pulse is rapid and weak, the respiration quickened. The uterus is generally involved, the lochia scanty and offensive. There is pain in the hypogastrium and groins. Diphtheritic patches may appear on the third to seventh day of puerperium.

Endometritis and metritis may be simple or diphtheritic, the latter being more serious. The degree of fever depends upon the severity of the infection and the promptness of treatment. The inflammatory process is apt to spread from the endometrium and involve the tubes

¹ The secret of successful obstetrical as well as gynæcological or general surgical operations lies in the care with which the operator and assistants cleanse themselves. Dr. Parkes, of Chicago, has just reported (American Journal of the Medical Sciences, September, 1890) a series of thirty abdominal sections, with a mortality of only four. These sections were done in the public clinic room before several hundred students. Great attention was paid to the surroundings of the patient, and Dr. Parkes says, "My own belief, which I have put in force so far as these thirty cases are concerned, is that it is what is put into the abdomen which causes trouble, and also that it is the preparation of the operator and his assistants, and of everything that touches the patient about the wound, from which safety comes."

and ovaries, causing salpingitis, oöphoritis, and finally even peritonitis. Metritis may lead secondarily to cellulitis and finally peritonitis.

Cellulitis (parametritis) is ushered in by a chill, followed by rise of temperature and acceleration of pulse and temperature. The height and duration of the fever depend upon the severity of the attack. There is swelling and tenderness of one broad ligament, followed by fixation and sometimes displacement of the uterus. The case terminates either by resolution or suppuration.

Lymphangitis may arise from either vulva or uterus. If *vulvar*, infection has entered through a sore on the vulva or lower fourth of the vagina, and the superficial inguinal glands swell. We find fever and rapid pulse with more or less severe local and general symptoms. If *uterine*, there is pain in the lower abdomen, and tenderness of the uterus, especially at the cornua. So long as the inflammatory process is limited to the uterus there is not much danger, but it is apt to spread to the cellular tissue and peritoneum. The height and duration of the fever depend upon the extent and severity of the inflammation.

Peritonitis may be local or general, and is one of the most dangerous of puerperal diseases. Rigor, intense pain in the lower abdomen, sudden rise of temperature, pulse and respiration rates, tympanites, and severe constitutional disturbances, are the most prominent symptoms. Other serous surfaces are apt to be involved, and pleuritis, pericarditis, or arthritis may appear, sometimes also pneumonia, endocarditis, or phlebitis.

Acute septicæmia was common in epidemic form in lying-in hospitals during preantiseptic days. Soon after delivery there is an acute rigor, the temperature runs up rapidly and either remains very high or sinks below normal, the pulse is rapid and feeble, the face anxious and pinched, the tongue dry and brown. Death occurs in a day or two or within the week.

Thus in the group of febrile affections due to infection by microbes or their products, we have more or less rapid rise of temperature, a more or less continuous duration of the same, with rapid pulse, quickened respiration, and other constitutional symptoms. Occasionally there is subnormal temperature, but then there is profound prostration. Sometimes chills followed by fever recur every two or three days, indicating fresh periods of absorption.

Besides septic wound-infection, many other causes may raise the temperature. *Cystitis* is a common cause of fever. (See Chart II.) During the puerperium, pre-existing febrile conditions are aggravated and dormant tendencies roused into activity. *Phthisis* may advance rapidly after the conclusion of labor and give rise to symptoms which may be

readily mistaken for sepsis. *Pneumonia*, *pleurisy*, or *bronchitis* may underlie the fever and for a time elude detection. The exanthemata, diphtheria, erysipelas, malaria, or rheumatism may precede, complicate, or follow labor. They may have been incubating at the time of labor and first manifest themselves during the puerperium; in fact, such diseases are apt to precipitate labor. Its effect upon febrile cases is generally injurious; the pain, violent muscular effort, interference with respiration and circulation, and loss of blood are apt to produce a condition not unlike surgical shock. The temperature falls below normal, the pulse becomes quick, irregular, and feeble, there is cold, clammy sweat, and great exhaustion. There has been great difference of opinion as to the effect of the exanthemata, diphtheria, and erysipelas upon puerperal women. Some maintain that *scarlatina*, for instance, is always the classical scarlatina with its typical rash and sore throat, modified perhaps, but still easily recognizable as scarlatina. Others hold that the scarlatinal poison produces a malignant form of puerperal fever indistinguishable from septic wound-infection, and quite different from ordinary scarlatina. As a matter of fact both may be right, and a study of clinical facts reconciles conflicting opinions. If the specific poison enter by the ordinary channels (throat and lungs), the symptom and course of the subsequent disease will differ but slightly from its usual type in the non-puerperal. If it enter through wounds in the genital tract, a totally different train of symptoms will be observed, resembling septic wound-fever of great intensity. The manner of invasion seems to modify profoundly the course of the infective fevers.

Non-Infectious Fever.—*Emotional disturbances* are apt to produce temporary elevation of temperature; the rise is generally rapid and unexpected, sometimes extreme, and the fall is as sudden as the rise. The temperature may be high while the patient is awake and may fall to normal during sleep. Whatever may be the exact explanation, it is certain that clinically we find elevation of temperature produced by profound psychical impressions, such as grief, anger, or fear. If the cause is transient, the fever is transient; if recurrent or persistent, the fever is apt to be recurrent or persistent. Emotional fever is very common among hospital patients, especially if anxious or depressed by neglect, grief, or shame. The non-receipt of a letter may run up the temperature to 104° F. as in Chart III. The most remarkable case of nervous high temperature is this one¹ (Chart IV.). The patient,

¹ Montreal Medical Journal, January, 1889.

II para, was twenty-two years old, capricious, violent-tempered, and subject to outbreaks of ungovernable passion on slight provocation. Labor was short and easy and the puerperium normal for eight days. Then she began to fret about the non-arrival of an expected letter; the temperature rose during the day and fell during sleep, and at the same time glycosuria appeared. The sugar increased to five per cent. and the specific gravity to 1028. As the temperature subsided, the sugar slowly diminished, and by the eighteenth day had entirely disappeared. She was preparing to leave the hospital when I requested her to remain a day or two longer under observation. She again began to fret, and sugar reappeared, but the temperature did not go up; a few days later more fretting ran up the temperature, but sugar did not return. In this case we can quite exclude the causes which ordinarily produce rise of temperature. The range of temperature was remarkable, rising during waking hours and falling during sleep without corresponding variation in pulse, the tongue being meanwhile fairly clean, the appetite moderate, the bowels regular, the general appearance good, and the lochia normal. Aconite, antipyrin, and quinine had no appreciable effect; the only drugs which seemed to be of use were potassium bromide and morphia (hypodermically). That the high temperature caused the glycosuria, or that glycosuria caused the elevation of temperature, is not at all probable; both conditions seem rather to have been due to some peculiar nervous influence. The sugar in this case was *glucose*, not *lactose*.

Exposure to Cold.—The diminished vascular tension after labor promotes perspiration and a general relaxed condition, in which chilling of the surface readily occurs. Exposure to the draught from an open window, falling asleep with the neck and shoulders uncovered or with the child at the breast, or imprudently getting out of bed insufficiently clad may cause a severe fibrile attack.

Reflex Irritation.—In primiparæ of sensitive nervous organization, high fever may follow the engorgement and distention of the breasts without suppuration. (See Chart V.) Digestive disturbances may be included under the same category. Food improper in quality or quantity, constipation, or indigestion may cause temporary rise of temperature. (See Chart VI.) From what I have said, it is evident that there are a great many causes which may produce fever in the puerperal period. The proper differentiation of these causes, so as to arrive at a just diagnosis and rational treatment, is sometimes by no means easy. A high temperature may mean a great deal or it may mean nothing; a thermometric diagnosis is impossible. As septic infection is our

great bugbear in obstetric practice, it is perhaps natural for us to think of septicæmia when we are confronted with fever in a puerperal patient. But we should be careful to exclude all other possible causes before we declare finally for septicæmia and begin radical intra-uterine treatment. How many practitioners nowadays go to one extreme or the other, either pooh-pooh sepsis and antiseptic treatment altogether, or else (ever haunted by Banquo's ghost) spy sepsis lurking behind every rise of temperature! The one extreme begets passive expectancy, the other a restless, fussy meddlesomeness. With clearer ideas and broader views, our attitude should be calm and confident, our treatment rational.

Of the practical lessons to be drawn from this subject, the first and most important is the *absolute necessity of antiseptics as a routine practice*, if we would secure the best results. If a man is to derive the full benefit from antiseptic theory and practice, he must believe in it, he must use it in all cases,—in the beginning as well as at the end. To be careless and slovenly while all goes well, and then to fly to stringent antiseptic measures when things begin to go badly, will not secure the best results. The more a man practises according to antiseptic principles, the more skilful will he become in the details, and the greater will be his success. Antiseptic measures often fail because they are ignorantly or unskilfully employed. Here as elsewhere, practice makes perfect. What are the most important details of prophylactic antiseptic practice which a man should use in his daily practice?

1. Prepare for a case of labor as you would for a major surgical operation.¹ You would not imperil an operation by uncleanness of person, instruments, or appliances; why should you take greater risks in a case of labor?

2. Prepare the *field of operation*. A general bath is advisable, and whenever possible the vulva, perineum, and lower abdomen should be thoroughly scrubbed with soap and hot water and then bathed with sublimate solution (1 to 1000). In the second stage of labor a prophylactic sublimate vaginal douche (1 to 2000) should be given, especially if there has been leucorrhœa, irritating vaginal discharge, or suspicion of gonorrhœa.

3. Thorough disinfection of hands, instruments, and everything brought in contact with the parturient canal. No old sponges, syringes, catheters, rubber sheets, bed-pans, or other utensils should be used

¹ In this connection Dr. Howard Kelley's admirable paper in the *American Journal of the Medical Sciences* (January, 1891) is worthy of careful study.

about the patient. Many an outbreak of puerperal fever has followed in the wake of a rubber sheet, bed-pan, or syringe loaned from neighbor to neighbor.

4. Vaginal examinations should be made as seldom as possible, and be as short as possible. Lubricants are unnecessary and apt to do injury. The finger should not be carried into the uterus unless for some special purpose. Diagnosis of position is far better and more safely made by external palpation. In hospitals where vaginal examinations have been almost wholly suppressed, febrile disturbances are rare. The pernicious practice of keeping the finger in the vagina during the second stage, manipulating the os and stretching the perineum, cannot be too severely condemned. A douche should immediately follow the vaginal examination.

5. After the completion of the third stage, a careful examination should be made of the vulva, vagina, and perineum in a direct light. If lacerations exist about the perineum vestibule or lateral vaginal wall, they should be closed with stitches. Large abraded surfaces may be cleansed and dusted with iodoform or brushed over with iodine. In maternities where minute care has been taken to close tears of the vaginal walls and cauterize abrasions, metritis, endometritis, and parametritis have almost entirely disappeared.

6. Thorough cleanliness and the use of antiseptic dressings throughout the whole puerperal period. Routine douching is unnecessary and unadvisable if proper care has been taken during and immediately after labor.

If a man carry out antiseptic measures in his obstetric practice as a routine, he need seldom feel alarm when febrile symptoms appear during the puerperium, for he will generally find the cause to be other than septic wound-infection. But if he do not adopt such measures, he will always be in a state of uncertainty and doubt when fever appears. Let me urge upon you the advisability of much careful observation of your cases after confinement. Leave a thermometer and temperature chart with each puerperal patient, with instructions when and how to take the observation, and you will have a fairly accurate record of your cases. The thermometer may be the first and at times the only external evidence of internal inflammatory mischief. A slight parametritis, which would disappear after a few days longer rest in bed, may be lighted into fresh activity by getting up too soon; the thermometer would probably direct attention to such a parametritis. In a word, we should treat our obstetric cases in a more scientific manner and upon surgical principles. The wounds are hidden, and the ill-

effects of slovenliness and inattention may not be for the moment as apparent, but they are none the less real. Gynæcologists tell us a sad tale of the miseries and sufferings of women from neglected inflammatory troubles traceable to confinement, miseries and sufferings which are quite preventable. Such a record is not creditable to us. We should not merely be content that our patients recover; we should be seriously concerned as to *how* they recover. And surely, if a little timely care and attention will secure them comparative immunity from distressing ailments which render life a burden, it is our bounden duty as humane men and intelligent physicians to realize our responsibilities and adopt every reasonable precaution.

SYPHILITIC ULCER OF THE VULVA; OVARALGIA, SPINAL IRRITATION, AND ANÆMIA.

CLINICAL LECTURE DELIVERED AT THE JEFFERSON MEDICAL COLLEGE HOSPITAL.

BY THEOPHILUS PARVIN, M.D.,

Professor of Obstetrics and Diseases of Women and Children, Jefferson Medical College.

SYPHILITIC ULCER OF THE VULVA.

GENTLEMEN,—The patient first presented was received in the hospital a few days since, and from the record made by the resident physician, Dr. Vesey, I find that she is thirty-four years old, and that she first menstruated at fifteen, was married at sixteen, and has given birth to six children, five of whom are living.

Two weeks before her admission a scaly eruption appeared upon her face, not manifested, however, elsewhere, either upon her body or members. Looking at her face, you will observe not any great desquamation, but a peculiar dusky-red color, first compared by Fallopius to that of lean ham, and which is quite characteristic of specific disease. On examining the labia majora, they are found to be swelled, though this swelling is not nearly so great as it was upon admission, when œdema made these organs appear four or five times their natural size. Upon the internal surface of each an ulcer is found, and a third just at the lower portion of the vaginal entrance. There is an offensive, purulent discharge. The patient has not menstruated for nearly five months, and therefore believes herself pregnant. The date of the infection cannot be determined, but probably it corresponds approximately with the first menstrual suppression.

The case presents four topics for consideration,—viz., ulcers of the external genital organs as one of the manifestations of secondary syphilis, the significance of the amenorrhœa, the local treatment of the ulcers, and the treatment of the constitutional infection.

The vulvar lesions of syphilis grouped under the general name of mucous patches present three forms,—the erosive, the papular, and the ulcerated. The ulcers originate independently of previous erosions or papules, and assume various forms, often circular, but sometimes like

an ellipse, a half-moon, or a ring, and more rarely as circinate, the last form being almost pathognomonic of syphilis. On closely examining the lesions in this case, you find that approximately they are circular in form. Consequent upon these ulcerations erythema is not unusual, and occasionally a labial abscess, but more frequently, as is the fact in this patient, labial œdema supervenes. This ulcer is not auto-inoculable, and thus is distinguished from a soft chancre.

A careful bimanual examination has satisfied me that this woman is not pregnant, or at least that there can be no pregnancy approximating four months' duration, and the explanation of her amenorrhœa is that it is part of the disease from which she is suffering. It is not uncommon for women who have syphilis to find the interval between their periods prolonged, in some cases the flow being absent for several months; and thus, in reference to its etiology, an amenorrhœa may be distinguished as syphilitic, just as in another case, an instance of which will be presented to you, the flow is absent because of malarial poisoning, and therefore may be called malarial amenorrhœa. Such names are not idle words, for, when we understand that they point to the essential cause of the disorder, they guide us to its removal as the most important step in treating the amenorrhœa. Cure the one patient of her syphilis, and the other of her malarial infection, and with restored health menstruation will return.

The local treatment will be, in this case, washing the vagina and vulva with a creolin mixture, one teaspoonful to a quart of water, twice a day, and dusting the ulcers with iodoform. I am very partial to creolin mixed with water as a vaginal injection, and therefore frequently prescribe it. I find, however, that not a few patients complain of the injection burning or smarting when used in the proportion mentioned, and therefore, if such complaint is made by this patient, the quantity of creolin will of course be lessened. In consequence of the unpleasant odor of iodoform, some advise pencilling the ulcers with a solution of nitrate of silver. Aristol has also been suggested as a substitute, but, from the few experiments that I have made with it instead of iodoform as a local application in the vulvitis and vaginitis of children, I have been disappointed, and so do not care to try it in this case. Iodal, not iodol, I have often thought would have all the advantages of iodoform as a local application, and probably be an admirable local anæsthetic. It is the analogue of chloral. But iodal is not found in commerce, and for some years I have been vainly attempting to procure it, but it appears to have been only rarely made, and then only as a chemical experiment.

The constitutional treatment has been with pills of the protiodide of mercury, one-sixth of a grain each, one pill night and morning, and two at noon; after two days an additional pill is given, and thus increased until some intestinal irritation is produced, when the quantity of the mercurial is reduced until merely the physiological effect is secured. At the same time she will take chlorate of potassium.

(In less than a month the patient's condition was so much improved that she was able to return home; the ulcers were completely healed in less than ten days.)

OVARALGIA; SPINAL IRRITATION; ANÆMIA.

Miss G., twenty-nine years of age. Family history not good. In childhood she had only those diseases occurring in that period of life. She first menstruated at sixteen years, and for some time the flow recurred regularly and was without special pain; but about four years ago she began to suffer severe pain in the lumbo-sacral and ovarian regions. Three years of treatment brought no benefit, and about a year ago the uterine appendages were removed in one of the hospitals of this city. After recovering from the operation she had for two months some relief from the ovarian and sacral pains, but they then returned with the same intensity, and for several months she has been bed-ridden. She has almost constant headache, and there is considerable tenderness in each ovarian region. Upon waking in the morning her hands are numb, while the lower limbs show perversion of sensibility in that, upon touching her at one point, she feels two points of contact, and *vice versa*. She is very pale, and has lost flesh. The uterus is retroverted and small.

The anæmic condition of this patient, gentlemen, is obvious. But I want to call your attention to another fact, and that is the very great tenderness upon pressure, or upon the application of a sponge first dipped in hot water to the spine; in other words, you have here a case of spinal irritation. So much having been demonstrated by the examination, I prefer that the patient should be removed before making any remarks in reference to her.

The usual result following removal of uterine appendages has occurred in this case, menstruation having finally ceased; but no benefit has come, and her suffering is as great as it was before the operation. I have spoken of this patient suffering from pain in the ovaries, but of course in so doing great liberty of speech is used, for the organs that were supposed to be the fountain and origin of her distress are probably now preserved in alcohol in some doctor's private collection

—certainly she is no longer their possessor; but she has the same distress, located apparently in the same part, for trunks of nerves distributed to the ovaries are telling the same tale that the terminal branches did, and she really has an ovarian pain as much and as severe as she ever had.

There is an old maxim in medicine that a doubtful remedy is better than none; and I can hardly wonder that this woman, after three years of severe suffering and of vain professional efforts for its relief, accepted the proposal for the removal of apparently offending organs. I have no doubt, too, that the gentleman who did the operation was conscientious in his action. Nevertheless, there is a sufficient number of cases on record to prove that ovarian pain is not, of itself, a reason for the removal of the ovaries. Térillon states that only exceptionally does ablation of the uterine appendages relieve ovaralgia, and Charcot, having occasionally the opportunity of examining women who had undergone the operation for this cause, has never observed a successful case. It should be remembered that many forms of neuralgia have a central origin, and the removal of the organ in which the disease manifests itself can bring no possible relief. It is not a light matter to remove sound organs, and especially those upon which the sexual character depends. The woman who during the reproductive period of life is deprived of her ovaries has lost her sex, has become a neuter, and the mental influence resulting from this anticipation of the menopause and the consciousness of her mutilation may have an injurious effect upon her mind.

If the rule to remove all painful ovaries and testicles—saucers for ganders as well as geese—were established, there would be a sure prophylactic against excessive increase of population, rendering unnecessary any new proclamation of Malthusianism. Certainly this has some advantages over the method of getting rid of surplus population suggested by Carlyle in “Sartor Resartus,”—three days spent each year in shooting all the able-bodied paupers,—or that of Dean Swift,—though the latter proposed his plan as relief of the poverty of Ireland,—selling yearling children for five pounds apiece, to be fried, fricasseed, broiled, or boiled, or cooked some other way, and eaten by such persons as were rich enough to indulge in such a luxury.

In these days, when such brilliant results have been obtained by abdominal section in cases of ovarian abscesses and tubal collections of pus,—in almost all instances the disease being the consequence of gonorrhœal or septic infection,—there is a glamour thrown over such surgery, and unnecessary operations are sometimes done. Probably

there is now needed, more than at any previous time in gynecology, faithful warning against undue exaltation of surgical over medical means.

In a case of hysteria with obstinate vomiting, amenorrhœa, and emaciation, is the pretended performance of removal of the ovaries advisable? Such a case has been reported, and temporarily at least this fraud upon the patient cured her. A few years ago a distinguished specialist in one of our great cities pretended to perform an operation upon a man,—doubtless he charged as much as if he had actually done the operation,—and a physician who is present in the arena informs me that the patient had no permanent benefit. This case became notorious from the facts appearing in a medical journal, and therefore the present allusion is made without hesitation.

When the physician must resort to a lie in order to succeed, wherein is he superior to the quack? He forfeits his own self-respect by falsehood, and may be led on into lower depths of immorality until possibly the public will lose all confidence in him. But independently of all consequences of false statements, and without attaching undue importance to the familiar maxim that honesty is the best policy, let us do right because it is right, speak the truth because it is the truth, and be honest with our patients instead of attempting their cure by lying to them in word or deed. According to Herodotus, Persian boys were taught at five years of age to ride, shoot, and tell the truth. Doctors, whether they ride or shoot, ought to refrain from uttering falsehood, from lying to their patients, no matter how good their motives. Temporary benefit may follow such violations of truth, but to suppose that permanent good, good in the long run, will result, is to assert that there is no righteous government of the race and of individuals, and that there are no laws of verity and justice, eternal as the heavens and wide as the earth. For my own part, were I suffering from malignant disease, disease that through weary months of terrible pain led to inevitable death, I would rather know it than be deluded by false hopes and promises of cure.

But now in regard to the treatment of this patient. The most important points are to improve the general condition and relieve the spinal irritation. For the latter I know of nothing better than occasional blisters, not large, but applied successively to the different points of greatest spinal tenderness. Iron certainly is indicated, and, considering the loss of flesh, cod-liver oil. The tincture of *nux vomica* will be given, and most probably some benefit may be had from massage and general faradization. For a few weeks no effort at exercise should

be made, for absolute rest will do more good. So far as the "ovarian pain" is concerned, it seems doubtful whether local treatment will be of benefit, though hypodermic injections of hot water and mild counter-irritants will be tried. The pain, not being local but central in origin, cannot be removed by these means.

In the conduct of such a case both the patient and the physician must be prepared for protracted treatment, a speedy cure being impossible.

(This patient remained in the hospital three months, and left in many respects much improved, but by no means cured. Indeed, if a year's faithful and intelligent use of remedies, the circumstances, too, being favorable, should make her well, the treatment might be called quite successful.

An interesting fact in regard to the form of iron which proved most useful during her stay in the hospital was observed. She took first the muriated tincture, then the iodide, and finally the albuminate; from time to time the number of red corpuscles was carefully counted by Dr. Harris, and it was found that the increase was decidedly greater while she was taking the last than when either of the others was given.)

**URETHRITIS; DILATATION OF THE URETHRA;
SOUNDING OF THE URETERS; ANTERIOR
ELYTRORRHAPHY; A NEW METHOD
OF PERFORMING LATERAL ELY-
TRORRHAPHY.**

CLINICAL LECTURE DELIVERED AT THE WOMAN'S HOSPITAL OF CHICAGO.

BY HENRY T. BYFORD, M.D.,

Professor of Gynæcology, Chicago Post-Graduate Medical School; Professor of
Clinical Gynæcology, Woman's Medical College of Chicago; Gynæcologist
to St. Luke's Hospital; Surgeon to the Woman's Hospital.

**URETHRITIS; SOUNDING OF URETERS; ANTERIOR ELYTROR-
RHAPHY.**

GENTLEMEN,—The patient now being anæsthetized represents a class of cases of great interest to the general practitioner and local gynæcologist. Although not very common, they cause great suffering, and can be relieved by ordinary treatment or very simple operations.

She came to me suffering with great pain about the entrance of the vagina, very much aggravated by being upon the feet for any length of time; and also with an almost constant feeling of tenesmus about the neck of the bladder and pain at urination. When she keeps quiet she does not suffer much; but as she has charge of a small country store, and is obliged to be on her feet a great deal, her sufferings are becoming unbearable. She is forty-three years old and has several children, the youngest of whom is eight years old. She has not been well since the birth of her last, although her sufferings have not been so severe until lately. Upon examination I found that there had been a superficial laceration of the perineum, but that the plentiful cicatricial tissue had, by its contraction, made quite a firm perineal body and prevented any considerable displacement of the parts about the vaginal entrance. Immediately upon the introduction of the finger, however, a pear-shaped tumor was felt just under the pubic arch extending backward for about an inch along the anterior vaginal wall. This tumor was semi-elastic, and exceedingly tender to the touch, so that the introduction of the speculum was at that time impracticable. The

cervix was found to be lacerated at both sides, its lips everted, and its mucous membrane swelled and softened, giving a velvety feeling to the touch; while two or three small polypi about the size of a split pea could be felt protruding. The uterus hung a little low in the pelvis, but was not otherwise displaced. A sound introduced into the urethra detected a contraction of a cicatricial character at the lower entrance, with dilatation above, as indicated by the fact that although the sound entered with difficulty, yet after introduction its end could be turned freely in all directions, particularly to the left or downward. The sound entered the bladder without even the normal slight resistance, thereby proving the existence of dilatation of the upper end of the urethra as well as of the middle portion. As the patient was desirous of speedy help, I concluded to put her in the hospital, examine her under ether, and do what might be found necessary.

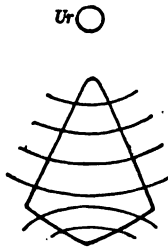
The patient being now thoroughly anæsthetized and in the dorsal position, the first thing I find is that the small pear-shaped, semi-elastic tumor has disappeared. This I take to be a result of catheterization, and indicates that the swelling was produced by the patency of the neck of the bladder making one cavity of the urethra and bladder. The urine had accumulated in the urethra, distending it and causing the subsequent tenderness.

Our first step will be to relieve the constriction at the lower end, which I now proceed to do by introducing sounds of increasing diameter. It dilates with some difficulty owing to the cicatrization of the lower peri-urethral tissue. I can now introduce the tip of the little finger, and, by steady pressure (being careful to take plenty of time, so as not to produce any laceration), I am able to get the entire member into the urethra. The pressure at the contracted point is so great as to be somewhat painful to the point of the finger around which it presses, and is a warning to me that the tissues are put upon a great strain, and must be handled carefully. The tip of the finger is in a funnel-shaped cavity, at the upper end of which there is a slight narrowing corresponding to the neck of the bladder. This place of narrowing, however, is so patulous that it does not offer the least resistance to the passage of my forefinger. Pressing onward, the finger-tip immediately comes in contact with the posterior wall of the bladder, which sags down into the patulous neck. The walls of the bladder present to the touch nothing very characteristic or abnormal. Upon withdrawing the finger, the mucous membrane of the urethra at its lower end is seen to be very much corrugated and congested.

Introducing, now, the forefinger into the vagina, I find it almost

impossible to detect the ureters on account of the general laxity of the tissues. By retracting the posterior vaginal wall, the cervix is immediately brought into view with its cluster of mucous polypi. The everted cervical mucous membrane is of a purplish hue, covered with a glairy mucus and as soft to the touch as a fresh-blood coagulum. Although there is moderate bilateral laceration, the cervix evidently is in no condition to hold the stitches in case we should attempt a trachelorrhaphy. I therefore snip off the polypi at their bases, and with the same sharp-pointed scissors scarify the cervical mucous membrane most thoroughly, liberating viscid mucus from numerous cysts.

As the relaxation seems to involve merely the anterior vaginal wall and adjacent connective tissue, I will confine operative measures to-day to that portion of the vagina covering the urethra and neck of the



Showing the method of introducing sutures. Ur, urethra; C, cervix.

bladder. It takes but a moment to excise with the scissors a triangular portion of the vaginal wall, whose apex is near the lower end of the urethra and whose base is at the neck of the bladder. I prefer to close the wound thus made with silk-worm-gut sutures because I can leave such sutures longer than silk without danger of ulceration. I pass them from right to left, including both edges and a bit of tissue along the median line. (See Figure.) Now that they are tied, the vagina feels quite normal in calibre, and, what is still more satisfactory, I can easily feel the ureters, which before were hidden by the lax tissues under them. To do this I introduce the index-finger with its palmar surface looking forward towards the pubes, press the finger-point up against the pelvic connective tissue just in front and to one side of the cervix, and carry it gently forward and outward towards Poupart's ligament. The

ureter is felt as a slight ridge over which the finger glides. When this is located, it can be easily traced towards the bladder or towards the pelvic brim by passing the finger in a zigzag manner across it as we work our way towards or away from the bladder.

In order, now, to be sure that these new ridges brought into prominence by the operation are really the ureters, I shall endeavor to pass a sound into them through the bladder. I therefore take a straight uterine sound, bend it very slightly at the end, and introduce it into the bladder until I am able to find its end with my finger in the vagina, the vesico-vaginal septum being between them. I seek the

ureter with my finger in the vagina, and trace it down as near to the bladder as I can. I now direct the end of the sound against my finger thus placed, and draw it a little way over the finger and towards the median line in the direction that I feel the ureters to take. By moving the end of the sound backward and forward along the line of the ureter, pressing at the same time gently down against the base of the bladder, I suddenly feel that it slips over what seems to be a very small tense fold of mucous membrane. This is the mouth of the ureter. By repeating this manoeuvre two or three times, the end of the sound slips into the ureter and passes without resistance along over the finger to the side of the pelvis. Now, I might merely have pushed the bladder over there, but if I had I should be able to turn the point of the sound towards the median line. This I cannot do, owing to a soft, elastic, but definite resistance.

In order to demonstrate the subject more thoroughly, I ask Dr. Cory to introduce his finger into the vagina, and attempt to follow the sound to its end. This he attempts and cannot do, and is satisfied that the instrument is in the long track of the ureter. By palpating the probe along it as far as the vaginal wall, I am satisfied that the ureter is normal. The same procedure convinces me that the left ureter is also healthy.

This method of sounding or catheterizing the ureters is original with me, but has not been employed by others because very few have learned how to palpate these canals. Palpation of the ureters is one of the easiest manoeuvres in gynæcological diagnosis, and really requires but very little practice. Those who have never felt them never find them, but those who have once succeeded in recognizing them can hardly introduce the finger into the vagina without feeling them. Having once found them with the finger in the vagina, their catheterization or sounding by the touch is comparatively easy. It is as easy for the gynæcologist to learn to do this as it is for the medical student to learn to catheterize the male urethra with the silver catheter.

Introducing, now, the little finger again into the urethra, I find the tissues about it to be very much contracted, and the neck of the bladder almost normal in calibre. Still further contraction may be expected as the result of the operation. It shall be my endeavor to keep the lower end of the urethra from contracting, however, as such contraction might again lead to dilatation above and reaccumulation of urine in the canal. The immediate result will be the relief of the soreness and the sensitiveness about the vaginal entrance that was due to the constant pressure within the urethra; but it is also expected that

the bladder will now be able to hold its contents during the ten days that the patient will remain in bed, and by that time will be able to do so under all ordinary circumstances.

But the cure would be incomplete if we did not subsequently treat the urethritis. I shall pass a large sound into the urethra twice a week, and probably swab it out with tincture of iron about once a week. If this does not restore the tone of the parts, the application of a ninety-five-per-cent. solution of carbolic acid once or twice a month in addition to the other applications will probably do so, care being taken to stop all local applications for a week or two in case too much irritation should at any time be produced.

In severe cases of this kind it has been recommended to excise a portion of the mucous membrane of the urethra in order to narrow its calibre, but I do not think that such is usually required in one of this degree of severity. In cases in which the dilatation has gone to the extent of forming a large urethrocele, the late Dr. Pallen, of New York, recommended and practised draining the sack by an incision at its most dependent portion in the vagina. If, however, the neck of the bladder be patulous, as in this instance, such an opening practically amounts to a vesico-vaginal fistula, and should seldom be employed. I have known of one case in which permanent incontinence of urine was produced by it.

The cause of this trouble undoubtedly came from a difficult labor. The cervix was lacerated, the vagina dragged down, the anterior wall bruised more or less against the pubic rami, and the perineum moderately lacerated. The perineum cicatrized, and so regained its strength, but the inflammatory action, and the premature assumption of her household duties by the patient, prevented complete involution of the vagina and tissues about it. The cicatricial contraction about the lower end of the urethra made it necessary for considerable pressure to be brought to bear in urinating, which pressure reacted upon the upper urethra and caused some dilatation. Her subsequent hard work while standing on her feet also helped to aggravate both the urethral and peri-urethral relaxation.

LATERAL ELYTRORRHAPHY.

CASE II.—From a superficial examination of our other patient, Mrs. S., one might almost say that she did not need the operation I propose to perform, and that the cervix, not the vagina, needed operating upon. While she thus lies upon her back, the vulva and perineum appear about normal. Upon introducing the finger, I find the

vagina to be voluminous, the cervix doubly lacerated to the second degree, soft to the touch, dark blue and eroded in appearance, and bathed in mucus. The slight touch of the sound brings blood from the endometrium, indicating endometritis. The uterus measures three inches, and would measure three and a half after an ordinary trachelorrhaphy. The peri-uterine tissues are somewhat thickened, the ovaries and tubes slightly enlarged and hanging low down on the posterior surface of the broad ligaments. We have, then, subinvolution of the uterus and vagina, laceration of the cervix, and general venous congestion of the uterus and its appendages.

I have not thought it best to operate upon the cervix, because the operation would not prove a success. It might also be somewhat dangerous to operate in this condition, on account of the liability to general inflammatory action in the pelvis.

The patient has been under treatment for some time, but improves very slowly ; hence I have concluded to wait no longer for the cervix, but to make an attempt to relieve the general pelvic congestion by raising up the pelvic floor and contracting the vagina. The operation will be a very simple one, will cause her but little inconvenience, and will enable us to get the uterus in condition for a trachelorrhaphy much sooner, to say nothing of the immediate comfort that will be given her. I take a pair of sharp-pointed scissors, introduce it into the tissues high up at the right side of the vaginal entrance, and make a slit about two inches long extending straight back along the lateral vaginal wall. I make a parallel slit along the posterior vaginal sulcus on the same side, and remove the intervening strip of mucous membrane, which is nearly an inch wide. This leaves the connective tissue exposed and bleeding quite freely. It may be closed in two ways,—by buried continuous catgut sutures and superficial silk-worm-gut stitches for the edges, or by the method which I am employing. This consists in interrupted catgut sutures passed deeply through the lateral edges, then into the loose connective tissue at the bottom, and out through the opposite edge. These, when tied, draw the loose connective tissue and cut edge of the posterior vaginal wall up to the side of the pelvis, and give it the connective attachment from which it was torn during labor. The wound is now closed, and represents a line of sutures extending from the right labium straight into the vagina at the side of the pelvis. As catgut sutures are liable to give way before firm union has taken place, I am introducing three or four silk-worm-gut sutures through the edges by means of the curved needle, and will leave them for a couple of weeks in order that the tissues may not part

asunder when the catgut is absorbed. I now perform exactly the same operation upon the left lateral vaginal wall, with the result, as you all can see, of bringing the posterior vaginal wall up against the anterior, and giving it quite a virginal character. As there is no external perineal laceration or displacement, I do not consider it advisable to operate upon the perineum.

The patient will be douched out with plain water every time she urinates for two days, then with a one-per-cent. solution of carbolic acid.

The object of this operation is not merely a narrowing of the vagina. It is intended to draw up the connective tissue beside the rectum as well as the posterior vaginal wall, and give them their normal lateral attachments, and at the same time afford a support to the venous circulation of the pelvis.

I consider it an improvement upon the methods hitherto recommended of removing strips from the posterior vaginal wall, whether median or lateral, for it affects the tissue higher up and gets at the firm fascial connective tissue at the sides of the pelvis.

CANCER OF THE VAGINA; RETAINED PLACENTA AFTER MISCARRIAGE; TUBO-PAROVARIAN CYST.

CLINICAL LECTURE DELIVERED IN THE HOSPITAL OF THE UNIVERSITY OF
PENNSYLVANIA.

BY WILLIAM GOODELL, M.D.,

Professor of Gynecology in the University of Pennsylvania.

CANCER OF THE VAGINA.

My first case is a very sad one. It is that of an old woman who says that she is sixty-three years old, but she does not know her age precisely, and looks over seventy. Although married for many years, she has never conceived, and yet, what is rare in women who have never borne children, she has a complete prolapse of the womb. Some months ago a painful ulcer developed on the posterior wall of the vagina, which resisted every kind of treatment. Her friends, therefore, clubbed together, raised a little money, and sent her to me. She came to me directly from her train early yesterday morning, and so stank from the discharges from her person that after she left I had to open all the windows of my office and sprinkle the carpet with Cologne water. Let me show you what caused the disgusting odor. It is this large unsightly sore on her vagina, which to-day is not so offensive as yesterday, because it has been disinfected by applications of a 1-2000 corrosive-sublimate solution. Yet the odor now is bad enough to those of us who are near her.

What is the nature of this sore? In complete prolapse of the womb an ulcer often makes its appearance on the inverted vagina,—a suspicious-looking ulcer with cleanly-cut edges; but it does not emit a bad smell, at least not an overpowering one, and it is benign, being amenable to treatment, and always healing when the womb has been restored to its natural position either by an operation or by an appropriate instrument. It is caused by the friction of the clothing and the irritation of the dribbling urine; for, when the womb hangs outside

of the body, it so drags upon the urethra as to bend its curve downward, a distortion which prevents the urine from escaping freely and in a stream. The sore in our patient may have originated in this way, and may have started as benign; but, if so, it has been goaded by many years of irritation into malignancy, and is now an epithelioma. It is a large and angry-looking ulcer occupying almost the whole of the posterior wall of the vagina.

Now that the poor woman has been dismissed, I can talk more freely to you. This sore is an unmistakable epithelial cancer, but I did not wish her to hear that word, which would have been equivalent to reading her death-warrant. She is hopelessly doomed; nothing whatever can be done to save her. Much, however, can be done for her comfort by the unstinted use of opium for the pain, and by applications of solutions of corrosive sublimate, boric acid, alum, or of chloral for the stench.

I have shown this case to you because it is an extremely rare one, for I have not seen a cancer of the vagina more than half a dozen times in my life. A mistaken notion prevails among the laity that pessaries cause uterine cancer, and many women for that reason object to their use. Had they attributed vaginal cancers to their use, there might be some show for their belief, for a pessary will often cause a post-cervical erosion or even an ulcer. Yet I have never seen nor read nor heard of a case of uterine cancer produced by a pessary; indeed, the women in my own cases had never worn one. It is the irritation of a torn cervix which usually causes uterine cancer, and not the pessary, which does not touch the womb at any point, and which, therefore, cannot possibly chafe or fret it into malignancy.

One word in regard to the persistent stench which often adheres to the fingers after a vaginal examination of cancer, in spite of the most thorough cleansing with nail-brush and soap. Ether or alcohol or turpentine will discharge it, and you should, after using one of these agents, carefully disinfect your hands still further by drenching them in a 1-1000 solution of corrosive sublimate, especially before attending an obstetric case. This is one of the reasons why I teach you to use your left hand for vaginal and other filthy examinations, and your right hand for midwifery work. Thus you are enabled to have a gynecological hand and an obstetric hand.

RETAINED PLACENTA AFTER MISCARRIAGE.

Our next case is one of more practical interest, because it is of a kind frequently met with. Six months ago this woman had a miscar-

riage at three months, and since that time she has had more or less dribbling of blood from the womb and several very severe hemorrhages. In fact, she has become quite exsanguine, as you all can see by her pale and bloodless appearance.

What is my diagnosis? Clearly that some portion of the ovum,—perhaps the membranes, more likely the small placenta,—being vitally adherent, has been retained. I say *vitally adherent* because the bloody discharges are devoid of smell, and the foreign intra-uterine body must necessarily be undecomposed. This shows that it obtains nourishment through vital attachments to the endometrium. By the double touch I find the womb very decidedly more bulky than an empty womb should be. But when I pass in the sound, the measurement obtained is only three inches, instead of four or even five as I had expected. How is this discrepancy to be explained? The tip of the sound is evidently arrested by the foreign body, and, when I try to push it farther on in various directions, blood trickles out of the os uteri. There is yet another confirmation to my diagnosis: the mouth of the cervical canal, without having been torn open, readily admits the tip of my finger. Experience teaches us that a patulous os in a bleeding womb means some intra-uterine foreign body. The womb, resenting its presence, tries to force it out, and this persistent and often painless tenesmus keeps the os uteri open.

To impress the matter thoroughly on your minds, I shall now give you two object lessons: the one, how *not* to remove this foreign body; and the other, how *to* remove it. Most physicians try to get it away by the curette. Yet the curette, while a very valuable instrument to shave or scrape off fungous vegetations and other small growths from the endometrium, is not only powerless to remove more bulky bodies, but it will cause an alarming loss of blood. Let me prove this to you, just as I have proved it to myself by bedside experience.

Our patient, thoroughly etherized, is brought down to the end of the table, and each leg is supported by an assistant. The vagina is carefully cleansed by a 1-2000 mercuric solution, and all the instruments are laid in the same antiseptic fluid. Introducing a speculum, I catch the anterior lip of the womb with a tenaculum and drag the cervix into view. All of you can see it distinctly, for, fortunately, I can drag it down unusually low, actually to the vulvar outlet. Now I pass in the curette, and rapidly scrape the womb in every direction. To the feel it clearly catches something, but it slips off and brings nothing away, and the result is a bad hemorrhage; a hemorrhage, indeed, so alarming that I hastily withdraw the curette

and plug up the cervical canal by forcing in the tip of my finger. When I used the curette I knew what was coming, for, to use a frontier phrase, "I have been there before;" but I hardly expected such a realistic illustration. Since I have the womb safely corked with my finger in its os as a stopper, let me explain this hemorrhage. The curette hooked into the foreign body and tore it off from some of its attachments. This at once opened up large uterine sinuses. These bled furiously, because, in the very nick of time, when most needed, the curette slipped off and could not withdraw the foreign body. The womb, therefore, being still distended, was not able to constrict itself into its narrowest compass, and thus close these gaping blood-vessels; for only by firm uterine contraction, wall to wall, can such a hemorrhage be checked.

With this illustration of how not to do it, let me now show you how to do it. Removing my finger from the os uteri, I introduce a small fenestrated polypus-forceps, open it, close it, and at once with a half-twist remove this foreign body, which is as large as the first joint of my thumb. Upon closer examination it proves to be a small placenta rolled up on itself like a scroll. It is perfectly sweet, which shows how vital was its attachment to the womb. Some blood is escaping from the os uteri, so I inject a syringeful of hot vinegar which is on hand, for, knowing beforehand what would happen, I had prepared myself for every emergency. The hemorrhage has been promptly checked, as it always is, and I now search for more fragments, but find none. The womb will now be flushed with a 1-4000 solution of corrosive sublimate, and a suppository containing ten grains of iodoform will be slipped into the vagina. As soon as the woman comes sufficiently out of the ether to swallow, she will be given a teaspoonful of fluid extract of ergot. Had I the proper solution of ergotine on hand, I would give her at once a hypodermic injection of it, but the bottle has been mislaid, and, as the danger from hemorrhage is very trifling, it is not worth while to hunt for it. The official fluid extract is not suitable for hypodermic purposes, because it gives great pain, stains the skin, and also is liable to form an abscess at the point of puncture. Yet, nevertheless, in any case of serious flooding, it should be injected promptly under the skin.

What was the duty of the physician at the time of the miscarriage? Clearly, to remove the placenta by hook or by crook. But, when I say "by hook or by crook," I am speaking metaphorically, for I mean the fenestrated forceps, or the index finger, and not the curette, although the latter really is a hook and crook.

TUBO-PAROVARIAN CYST.

My third and last case I shall examine without the aid of ether. It is that of a woman of forty, married twenty years, who has given birth to nine children. Two years ago an abdominal pain set in, which has troubled her more or less ever since. Then a cyst developed, which, after reaching a large size, has several times rapidly disappeared, coincidently with the escape from the vagina of a large quantity of fluid, sometimes as much as a bucketful in the twenty-four hours. This fluid is as clear as spring-water. The last time this happened was about a week ago. There has been so little reaccumulation of fluid since then that yesterday, when I carefully examined her, not a single trace of a tumor was discoverable. It is true that her abdominal walls are laden with fat, yet I am sure that, in spite of the difficulty of feeling through them, I would have discovered any tumor as large as an orange.

What is my diagnosis here? Unhesitatingly, a parovarian cyst which bursts into a Fallopian tube. A parovarian cyst is the only cyst of large size which contains a clear, limpid liquid. It is the only cyst which usually is monolocular,—viz., with a single sac. Its walls are always very thin and, therefore, liable to burst, and they have spread out over them the fimbriated extremity of the Fallopian tube, into which they could readily burst. Finally, being composed of but a single cyst, and that thin-walled, whenever they are emptied by rupture or by the trocar, they so wholly collapse as to render it almost impossible to find a trace of them.

What is a parovarian cyst? It is a cyst of that portion of the broad ligament to which the ovary is attached, and it starts probably in one of the minute tubes which are there found. Its life-history is somewhat different from that of an ovarian cyst. It grows much slower, is rarely so tense, and varies so greatly at different times in the degree of tenseness as to suggest periods of absorption of the fluid. It does not make so profound an impression upon the general health. In the majority of cases there is no emaciation, no failure of strength, no change in the complexion. Its bulk may cause inconvenience, but it in itself is innocuous. Sometimes after being tapped it may partly refill and then wholly disappear. Usually free from every kind of adhesion, it is very easily extirpated, and the percentage of deaths is the lowest of all abdominal sections. When one is removed, it is readily recognized by its opalescent color and by its delicate walls, which are covered both by a net-work of very distinct blood-vessels

and by frond-like expansions of the fimbriated extremity of the Fallopian tube. The ovary will be found on its lower end, either wholly distinct from the cyst, or else flattened, enlarged, and plastered over its wall. As the corresponding ovary is almost always diseased in these cases, and as a parovarian cyst is liable in time to take on papillary degeneration and, by bursting, to infect all the abdominal organs, the rule is to remove it. Consequently, I shall advise our patient to submit to the radical operation just as soon as her cyst fills up again sufficiently to be recognized.

Pediatrics.

TONSILLAR DIPHTHERIA.

CLINICAL LECTURE DELIVERED AT THE GOOD SAMARITAN HOSPITAL.

BY F. FORCHHEIMER, M.D.,

Professor of Physiology and Clinical Diseases of Children in the Medical College of Ohio, Cincinnati, Ohio, etc.

I WANT to say a few words to you this evening about diphtheria, viewing it from a clinical stand-point merely. On this occasion I shall speak about the diagnosis and treatment especially, leaving the other points to be discussed only incidentally.

You see here a male child four years of age, whose history is as follows: The boy has not been well for several days, but there is nothing tangible in his case. Previous to the present indisposition he has been in good health,—has had no trouble of any sort. There is no special family predisposition.

The only trouble, the mother tells us, is that the child has been ailing for the past few days. He vomited yesterday. She has noticed that he was a little paler than usual. He does not complain of any special pain, and the mother has not been able to localize any trouble until this afternoon. The child has been getting a little warmer in the evenings, this being more marked on the second evening than on the first. He had two loose passages yesterday. The nights are comparatively restless. In one word, the little patient is sick.

Now, look at this boy, and you see before you a very well nourished child. The only thing that strikes you is that he is somewhat pale. The eyes are dull, the cheeks slightly flushed.

Let us begin the external examination, commencing at the head and going downward, as is always our custom. You find first that the glands at the angle of the jaw are enlarged; not only are they enlarged, but they are decidedly painful. Pressure increases the pain. In the majority of the cases at this period, just as in this one, the mother does not know that there is anything the matter with the child's neck. You find further that not only are the glands of this

region enlarged, but you can trace the lymphatics by their enlargement down to the clavicle. As you know that these glands are supplied by the glands of the tonsil or of the nose, you recognize by this examination that there is something wrong with either the tonsils or the nose. In many cases you find that the post-cervical glands are also enlarged, as well as possibly the glands of other regions; you may or may not find the spleen enlarged. The chances are that the spleen is enlarged, —and so we find it.

You now come to the examination of the throat. You look in, and find, in the first place, that the tonsils are slightly enlarged. You look a little closer, and find that the tonsils are somewhat reddened. You examine still more closely, and find patches on one tonsil, whitish-gray in color, situated above the upper half of the tonsil, and apparently adherent to its tissue.

You are now ready to make a diagnosis. There immediately comes to your mind the question, What can this be? This question can be readily answered. You say that a patient who has been perfectly well, who has been ill only three days, a patient in whom the principal symptoms are patches upon the tonsils and enlargement of the lymph-glands, along with more or less fever, a great deal of malaise, and some disturbance of the alimentary canal, can have only one of two diseases. The widely-different nature of these two affections makes it important that we shall make a diagnosis between them if possible, and as early as possible. What, then, are these two diseases? One is the affection which is called follicular tonsillitis,—which term, by the way, is a barbarism; the other is diphtheria.

In the former of these affections, which I prefer to call follicular angina, you have a disease which is comparatively harmless; in the other you have a disease which may, and frequently does, terminate fatally. I should amend the former somewhat, perhaps, by saying that there is a form of disease of the tonsils and its vicinity that we sometimes find in scarlet fever. This has been called diphtheria, and possibly may sometimes be diphtheria; but in the majority of cases the membrane which is found in scarlet fever on the tonsils is not diphtheria at all, but is in all probability a different process. This disease we can exclude very readily in the patient before us, by simply examining the skin; for in a case of scarlet fever, after forty-eight hours the eruption must have appeared.

Another source of error is the formation of eruptions on the tonsils. We may have here located the eruption that occurs in measles, in small-pox, in varioloid, in varicella, and in those forms of stoma-

titis known as stomatitis aphthosa and stomatitis mycosea ; but all these can be differentiated by the form of the eruption. We have therefore in this case only two diseases between which to differentiate,—namely, follicular angina and diphtheria.

Before going on let me say that there are very good authorities who teach that follicular angina and diphtheria are the same process. I want to say to you that they are, as a rule, two very different processes. I admit that there are cases in which differentiation between the two is impossible, for the simple reason that we are dealing with an anatomical process due to various causes. I have seen cases of diphtheria that began as follicular angina. It is in these cases impossible to differentiate, therefore, because the difference does not exist. There are cases, too, of follicular angina in which the filling of the follicles is by the diphtheritic process. We can in these cases make the diagnosis only by waiting, and then it is not usually difficult. Given a case like this one before us, and the differential diagnosis is not difficult ; but given a case in which the follicles are filled up, in a child that has been sick only from eighteen to twenty-four hours, and it is very difficult to make the diagnosis. But, if you wait from twenty-four to thirty-six hours longer, this will be comparatively easy.

Now let me show you what the points of differential diagnosis are. In the first place, let me say to you that the onset of the disease in follicular angina is somewhat different from what it is in diphtheria. In follicular angina the onset is a very rapid one. The child is put to bed well, not complaining of anything ; in the morning it is found in a convulsion, if it is young enough to have a convulsion, or a chill, or feeling perhaps very ill, with a certain amount of brain-symptoms, delirium, muscular twitchings, and a very high temperature. The beginning of diphtheria is, as a rule, as I have described it in connection with this case. It is slow, insidious, so that for perhaps two or three days neither mother nor child knows anything about the throat's being affected.

The next thing is the peculiar appearance of the tonsils. If I draw on the black-board here a representation of the tonsils, you will see that there are on the upper profile of the tonsils a certain number of spots, varying in color, usually of a yellowish color, and if you look carefully you will see that the spots are localized in the follicles. On careful examination, again, you will find that one or another of these spots seems to protrude from the follicle. You will find furthermore—a thing that I lay some stress upon—that the number of spots is, as a rule, greater in the lower half of the tonsil than in the upper half.

You will find that, if there is anything which looks like a membrane, it will be found in the lower half of the tonsil, and, as a rule, best developed at the lowest portion of the tonsil, where there is a slight fold of mucous membrane that forms a sort of cup into which this exudation drops. In other words, you find the upper portion of the tonsil comparatively free, the lower portion being thoroughly occupied by these spots.

Now let me show you the appearance of a case in which the diagnosis was positively diphtheria, as I saw it only a few days ago in a young physician of considerable prominence. The diagnosis was positive, for the simple reason that upon the right tonsil the disease began as a true diphtheria and upon the left as a follicular diphtheria. The day on which I first saw him, which was the fourth day of his illness, I noticed a spot upon the left tonsil, a spot which filled up the follicle. That was in the morning. By evening the spot had spread, and with it a decided membrane had formed. By the next morning we found that the anterior pillar of the fauces and the uvula had lines on them. Of course the appearance of the membrane upon the uvula is almost characteristic; but, given a case in which you have the membrane only on the tonsils, how are you to make a diagnosis? You can make it by the appearance.

Now as to the membrane itself: In diphtheria the appearance of the membrane is altogether different from what I have described as occurring in follicular angina. In the first place, the membrane of follicular angina is upon the tonsil. If you introduce a probe wrapped with cotton in a case of this character, you can, as a rule, strike off all the membrane and can roll it up on the probe. Not so with diphtheria. Suppose that you should try to remove the membrane of diphtheria as we did in this case; you cannot move it. At first the membrane of diphtheria is beneath the epithelium. Later it breaks through the epithelial covering. After that, part of the membrane can be removed very easily. If, however, you remove the membrane of diphtheria, you have under all circumstances a more or less denuded spot. If you are careful and do not use too much force, in follicular angina there is no bleeding at all from the denuded surface. To the practised eye the appearance of the diphtheritic membrane in its very inception is almost characteristic. If you throw light upon the diphtheritic membrane in such a way as to get the reflection, you see that the membrane is within the epithelium, if you see the case in the beginning. In a case of follicular angina, however, the membrane is moist; there is not that shiny reflection. In the color of the membrane

there is nothing characteristic of one or of the other affection. One observer says that the diphtheritic membrane is gray, another that it is white, another that it is yellowish. The truth is that it may have any of these colors. You cannot make a differential diagnosis from the color alone.

Suppose, now, that you are called in to see a case in which you are not able to make a positive diagnosis at the start, you have only to wait twenty-four hours and you will find that the course of the affection has become characteristic of the disease. You will find in a case of follicular angina that the symptoms go as quickly as they came. In diphtheria you are dealing with a disease which affects the entire economy, a disease that produces decided symptoms, that lasts for a considerable time,—one week, two weeks, sometimes, in cases that have been considered a chronic form of the disease, a little longer. The principal evidence of constitutional involvement is albuminuria. If you have albuminuria in a case with the symptoms that I have described, you are justified in saying that you have a case of diphtheria. I am aware of the statement that has been made, that albuminuria may occur in follicular angina. That is not true in the vast majority of cases. If a patient with follicular angina has albuminuria, you may say that that patient has the follicular form of diphtheria. If paralysis follows a case of so-called follicular angina, you know that it was a case of follicular diphtheria.

Diphtheria is always a serious trouble, the prognosis always grave. The mortality that has followed some epidemics is very high, always sufficiently so to justify us in making a guarded prognosis. You are fully aware of the gravity of the disease. You know that in a community the introduction of one case may carry off a great number of children. You know, therefore, how important it is to make a differential diagnosis as early as possible. When you are able to make the diagnosis, the isolation of the case is imperative. I do not mean to imply that you are to isolate only your cases of diphtheria. There is no doubt in my mind that follicular angina is contagious. And, in the next place, you may be in doubt or error as to your differential diagnosis. It is better, therefore, to isolate all cases of this class.

I do not want to say much now about the cause of follicular angina. It is due to one of the pus-producers, and it, in contradistinction to true diphtheria, is characterized by repeated attacks. If, therefore, you are called in to see a case of sore throat in an individual who has been subject to repeated attacks of the affection in successive winters, the probability is that you have to deal with a case of follicu-

lar angina. These are the cases of homœopathic diphtheria. These are the cases that demonstrate the presumed efficacy of numerous remedies. They get well if let alone. So much for the differential diagnosis. Time will not permit me to say more.

I now want to say something about treatment. I think that we have in late years made great advance in the treatment of diphtheria. I am sure that I now get better results than I got four years ago. I want first to show you the theories on which the treatment is based and then to say something about the remedies. We must first take the prophylactic treatment.

First, how contagious is the virus of diphtheria? I should say that the virus of diphtheria is a very contagious one. Although the virus in its pure form is extremely contagious, as a matter of fact, I do not think that diphtheria is very often carried by the physician or by any one coming into contact with the patient. That is simply a result of my own observation. I know very well that the statement of eminent bacteriologists at the last International Medical Congress at Berlin was that diphtheria can be carried by the clothes, by cooking-utensils, by articles of food, etc.; but I have certain reasons to doubt this. This does not, however, preclude the necessity of your being absolutely cleanly. By this is meant the doing away with the evidences of the possibility of contagion after being to see a patient with diphtheria. Now, how do you do this? In the first place, handle the patient as little as possible, and not for your own sake, for a physician is never afraid of a disease he is fighting, but for the sake of your other patients. Come into contact as little as possible with the patient and with the bedclothes and other articles used by him. This does not mean that you are not to feel the pulse and examine the throat, or do whatever is necessary. But in examining the throat be sure to use something that can be thoroughly cleansed. Never use a spatula. It may detract somewhat from the moral impression you make upon the patient in asking for an ordinary spoon, but let me assure you that this horrible disease has been carried more than once from one patient to another by the use of the spatula. You have not time to sterilize the instrument for a half-hour after each time you use it, and you cannot sterilize it with a solution; and, further than this, a child is afraid of a spatula when it is not afraid of a spoon.

In the next place, how much disinfection of your clothes and of yourself must you do before you can safely see the next patient? I cannot reduce this matter to a mathematical problem, but I should say that a drive in the open air for a half-mile or so is sufficient to remove

the infection if you have been careful not to come into direct contact with the patient's person. You are of course carefully to wash your hands after seeing one patient before seeing another.

Now in regard to the disinfection of the room. I make it a rule to allow the patient to remain in the room for several days after the membrane has disappeared ; I then begin to disinfect. The first agent is boiling-hot water. Everything the patient uses and everything that he contaminates by expectoration is to be put into boiling-hot water. I am old foggy enough to believe in the efficacy of sulphurous acid gas. I therefore lock up the room and burn in it a sulphur candle, at the same time introducing steam. This is repeated the next day and daily for three or four days. The windows are then allowed to remain open day and night for a few days. After this the room is ready for occupancy. As for the patient, he gets a bath of warm water followed by alcohol, and his hair is washed in alcohol. These are the precautions. Of course none but the attendants are allowed to come in contact with the patient.

There are a great many things we might discuss, but our time is limited. One thing I want to speak about is the closure of the schools. Some of you will doubtless sit ere long in the councils of your towns and villages, and an important question that will come before you will be that of closing the schools on the occurrence of an epidemic. I am told that they have passed a regulation in our own city which prohibits the brother of a child affected with diphtheria from going to school for thirty days. I am opposed to this regulation, for the reason that diphtheria is caught on the streets, in the cars, at theatres, at church, and wherever people congregate. Now, if the children are taken away from school, they come into contact with everybody and with other children, and they are just as much exposed to the disease as they are in school. The only way to break up an epidemic is by the seclusion of the sick and the frequent careful examination of the well. The children should be carefully examined by a competent physician every day. In this way we would succeed in breaking up an epidemic very much better than in the way we are now doing it.

The treatment of the disease can be divided into two parts. The features of the treatment to be considered refer to the presence, in the first place, of a membrane, and, in the next place, to the results of the formation of this membrane. Now, danger comes to the patient both from the membrane and from the poison that is formed by the membrane ; then, of course, we have also to speak of the sequelæ. We divide the treatment, therefore, into the local and the constitutional :

the local treatment has for its object the removal of the membrane, and the constitutional the removal of the poison that is produced by the bacteria or the chemical products of the disease. The local membrane is produced by the Löffler-Klebs bacillus; through the biological activity of this bacillus there is produced a poison which has been isolated, and this poison, belonging to the toxalbumins, produces the constitutional disturbances.

Now, as I have said, the ideal treatment of diphtheria must look, first, to the prevention of the extension of the membrane; and, second, to the arrest of the constitutional disturbances. It is now positively proved that the toxalbumins produce the sequelæ,—the paralysis, etc. Our first object, therefore, is to remove the membrane. How is this done? One way to do it is to take a probe with cotton wrapped around it, dip this into a solution of corrosive sublimate (one to one thousand, with five parts of an acid, usually citric acid), and rub off the membrane. That looks very pretty on the black board, and there it is a very simple thing to do; but if your patient is a child three years of age, and you try to rub anything off its tonsil, you will have a fight, and the chances are that the child will come out ahead, and that if you persist you will do more harm than good. If you have a patient who keeps perfectly quiet, so that you can get at the membrane and the membrane only, without touching any of the rest of the tonsil or any other healthy tissue, you are justified in using a cotton-wrapped probe or a camel's-hair brush, and in no other cases, because in other cases you would do a great deal more harm than good, for you would rub off the membrane and the epithelium, so transplanting the bacillus from one place to another. So you use this measure only in exceptional cases, and rarely in children. Even in grown people it is difficult to do.

And yet you need local treatment to remove the membrane. Comparatively recently the galvano-caustic has been recommended. The same difficulty that is found in using the pencil will be found a thousand-fold worse with the galvano-cautery. I have never used the method, but in principle it is very good. No special progress has been reported with it.

The method I use is by inhalation, and I continue this day and night, every hour. Whatever you do in this way, do it constantly. If I can impress on you the necessity of this, I have done enough for to-day. I do not care what you use for local treatment,—whether it be a salt of iron, of mercury, or what not,—whatever you do, use it constantly, day and night. The principle is simply a removal of the already-formed

membrane, and that which is constantly forming. You may say you disturb the patient's sleep ; you do not do anything of the sort. As a rule, the patients go to sleep immediately after the treatment. My favorite remedy for local application is either trypsin or papayotin. Trypsin I use in a solution of two-per-cent. strength. It sometimes digests more than we ask for, so that you can often get along with a weaker solution. Papayotin may be used in the same strength. Either should be used in an alkaline solution. Papayotin has not the offensive odor of trypsin, and if you use the latter you must see that you get a good preparation.

Now, suppose that you suspect that you are dealing with a case of mixed infection, what are you to do? I use, instead of the remedies just given you, eucalyptus, and the way I use it is by simply diluting the oil with alcohol in the strength of one part to twenty, making the applications every hour. These are my favorite ways of treating the disease.

In addition to this, I make cold applications to the throat, and give the patient everything cold,—ice, ice-cream, ice-cold milk, as much cold as he can swallow, even small pieces of ice. Do not forget the ice-bag and the cold food. These are used because the active poison of diphtheria does not thrive at low temperatures.

Now for the general treatment. In the first place, employ free stimulation, giving as much alcohol as the patient can bear. In the next place, the constant, uninterrupted internal use of corrosive sublimate in very large doses is advantageous. What do I mean by large doses? A patient two years of age takes one-fourth of a grain in thirty-six hours. Give to a patient three, four, or five years of age a quarter of a grain in four ounces of solution, a teaspoonful every hour, and increase the dose until you give the patient one-fourth of a grain, half a grain, and then, if necessary, a grain of corrosive sublimate in twenty-four hours. The diphtheritic poison is very treacherous. I have frequently heard men say that they had left a patient well the night before, without any exudation on the tonsils, and that in the morning the throat was covered. For this reason, we must continue the treatment without intermission until recovery is complete. It is quite remarkable how well this treatment is borne by the patients; and how much sublimate can be taken without harm.

Let me say, in conclusion, that, while we are far from having accomplished all that will be done in the treatment of diphtheria, the results at present warrant us in stating that the prognosis is very much better than it was ten years ago.

DIFFERENT TYPES OF PARALYSIS IN YOUNG CHILDREN.

CLINICAL LECTURE DELIVERED AT THE NEW YORK POLYCLINIC.

BY LANDON CARTER GRAY, M.D.,

Professor of Diseases of the Nervous System, New York Polyclinic.

GENTLEMEN,—I thought I would prepare for you a clinic representing several forms of paralysis in young children, and I have taken the trouble to get together a number of cases as they came into my clinic.

In the first place, here is a child readily recognized from the size of the head as a case of hydrocephalus; and, as a matter of course, you will also recognize the cause of this child's helplessness, practically amounting to paralysis, although it is not such in the strict sense of the word. Then, here is a little girl, the little case that I showed you the other day, that probably most of you remember, who is paralyzed in all the extremities to such an extent that she is not able to make voluntary use of them, who cannot talk, who is far below the intellectual standard of a child of her age (three years), and who has evidently been backward from birth, and in whose case the pathological trouble is very evidently that form of encephalitis that we know as porencephalitis.

Here is another case of cerebral defect and inability to use the limbs due to meningitis. The child has a distinct history of meningitis affecting the base of the brain, and from it this paralysis has come.

Of these other cases, one is of mixed type,—has both the cerebral defect and loss of power in the upper and lower extremities,—and represents that type of paralysis in children to which has been given the name of spastic paraplegia, or spasmodic paraplegia, and the pathological lesion in which is largely a matter of speculation, being possibly a porencephalitis, that kind of encephalitis which leads to the absorption of a greater or less amount of brain tissue, or possibly due to a

meningitis, or to a cerebral hemorrhage, or to some injury inflicted at birth ; but the clinical characteristics of which are an association of mental alteration with paralyzed and spasmodic condition of the lower, and also to a certain extent of the upper, extremities.

Now, take all these cases, and you see that they represent the cerebral type of infantile paralysis, and inasmuch as in the cerebral type the brain is necessarily affected, they form one group so far as diagnosis, prognosis, and treatment are concerned, and are to be sharply distinguished from these other cases here on the left of me of spinal paralysis, and in which there is no cerebral implication whatever.

Let us look more closely at these little fellows. Here is a child whose upper back and shoulder muscles are atrophied. It has no paralysis or atrophy of the lower arm, and no paralysis or atrophy of any of the other muscles of the body, and no cerebral defect whatever.

Here is a little boy in whom the defect is to be seen in the anterior tibial group and calf muscles. No other muscles of the body are affected, nor is there cerebral defect of any kind.

In this little girl there has been a spinal affection, implicating certain muscles of the leg and thigh, which, as she has now reached the age of twelve, has led to a shortening of the limb, so that she walks with a limping gait. That is a peculiar locomotor paralysis in the muscles of the lower leg, and does not affect any other muscles of the body, and has accompanying it no cerebral trouble whatever.

Here is another child in whom the trouble lies, as in that one I showed you a moment ago, in the anterior tibial group of muscles, being purely localized in that group.

Here is another little fellow whose whole arm is affected, the upper arm, the lower arm, the hand, and the shoulder-girdle muscles also. That again is a paralysis localized in one limb, not affecting the brain in any way, and not implicating the other muscles of the body.

Here is a little man in whom only the deltoid group is affected.

You see, therefore, that if you compare the group on the other side of the room and the cases on this side, there is a sharp distinction between the two classes : a series of cases that you may call the cerebral type of paralysis all leading to a cessation of the development of the brain, all therefore being of very evil prognosis so far as regards the child's career in life, and all of them being uncontrollable by medical art ; whereas the group on this side is all of localized paralysis, implicating only a particular group of muscles, and not affecting the intelligence in any way whatsoever, so that the prognosis, except for the

muscles immediately affected, is excellent, while there is no danger to be feared from any impairment of the intelligence,—the child's career is not likely to be interrupted, except so far as a loss of power in a certain group of muscles will affect it, and treatment applied to that group of muscles will effect a large degree of improvement.

You will thus see that it is of immense importance for us to differentiate two groups of cases.

I hope, now, that whenever a child about or under three years of age comes to you, you will ask yourself the question as to whether it is a cerebral or a spinal paralysis. If it is a cerebral paralysis it is due to some one of the causes I have enumerated. There may be a porencephalitis, by which is meant, as I have told you, that form of encephalitis leading to an absorption of a greater or less amount of the cerebral substance, so that either a small cavity results, or, in extreme degree, a whole hemisphere may disappear, as it not unfrequently does. Then there may be hemorrhage, and that hemorrhage may be in the pia mater, or may be from certain vessels in that tract running between the basal ganglia which is known as the internal capsule, the same tract into which hemorrhage occurs in what the older writers called apoplexy. When the hemorrhage is capsular, hemiplegia will result. When the hemorrhage is in the pia mater, you are more likely to get a paralysis of both lower extremities or both upper extremities. There may be meningitis, and meningitis may be either traumatic, cerebral, spinal, or from ear-disease. A meningitis from ear-disease in children so young as these is a comparative rarity. Ear-disease in young children most frequently results from scarlet fever or measles, and therefore in such young children as these you are not so likely to have a history of that kind as of a meningitis which results from trauma or from cerebro-spinal fever. The former is by no means infrequent in young children, due to difficult delivery, or the use of instruments, or the various injuries which children receive in childhood through the carelessness of mother and nurses, or to accidents. It has always been a mystery to me that the brains of little children do not receive more injuries than they do,—a small body with a big head, a pendulous head, seeming to topple over at every opportunity in the hands of careless nurses, it is a marvel to me that these heads do not receive a thousand injuries where they do receive one. Cerebro-spinal meningitis, either epidemic or sporadic, is, in the majority of cases, very easily diagnosed. Finally, there is a tubercular meningitis, which we may include under the head of hydrocephalus.

These are the chief causes which will produce the forms of paral-

ysis in this group of cerebral paralysis of the children whom you see before you. You can see that not one of these cases, except possibly those due to hemorrhage into the internal capsule, is cured by treatment. You cannot cure a hemiplegia due to porencephalitis, because the porencephalitis does its mischief at once. It melts down and absorbs cerebral tissue, and, when it has done that, there is no power that we know of that can resurrect that tissue. If the hemorrhage is into the pia mater over the cortex, the resultant inflammatory process leads to more or less destruction of the gray matter. If there is a hemorrhage into the internal capsule of the child and it is very small, it will perhaps do only a small amount of damage; but you notice I say that slowly, because I have some misgivings about the statement. That sentence recalls to my mind a case that I had a number of years ago in a neighboring city of a man who had murdered his wife in a drunken frenzy, and who was found several hours after the murder lying by her side in a pool of blood, so drunk that he only became conscious hours after his arrest. The District Attorney, thinking, from the atrocity of the murder, that he must be insane, sent for me to examine him. I found that he came of a family in Ireland consisting of seven brothers; that his brothers stood high in the church and were men of a high order of intelligence, of great energy and capacity, but that he had been the black sheep of the family. They had never been able to educate him, and he had sunk to the level of the lowest day laborer; had drifted to this country and passed his time alternately in the police courts and in the lowest sort of laboring work. I found that he was hemiplegic on the left side, that the hemiplegia dated back to early childhood, that there was a marked asymmetry of the skull, and a great difference between the size of the hemiplegic and that of the sound side, and I came to the conclusion that the man had had some one of these various pathological lesions of childhood which had been sufficient to arrest the development of the brain and keep it below the standard of the family, so that while the other brothers, having no pathological lesion, had been able to educate themselves and stand high in the church, he had never been able to keep above the level of the most degraded day laborer. I went to the District Attorney, who conferred with the judge, and the judge waived all ceremony and allowed me to address the jury. I told them that this man ought to be locked up in the State prison for life, because that would be humane to him and just to the community, but that hanging would be unjust and barbarous. They sent him up for life.

When hydrocephalus occurs, we all know the result, so I do not need to give much time to it.

If we observe the paralysis of the cases on the other side of the room and inquire into the pathological lesions causative of them, we will find that in every case there is either a spinal or a peripheral lesion, and that in not a single solitary one of them will there be the cerebral disturbances that we have seen in all those other patients opposite. In every one of those cases across the room there is either a lesion in the anterior horn or in the peripheral nerves; either neuritis or a localized myelitis of the anterior horn, so-called poliomyelitis, *πολιος* being gray matter, poliomyelitis anterior meaning therefore the same thing as myelitis of the anterior horn, the old name of it having been essential infantile paralysis, which we ought to drop entirely at the present day, because *all* these different cases are really infantile paralysis. The diagnosis is very readily made. If the disease is in the anterior horn of the gray matter, a certain group of muscles in one limb only will be affected, a group acting together for certain physiological purposes. If there is a neuritis, the muscles to which a given nerve is distributed are affected by that neuritis. In all these cases of the peripheral or the spinal type of paralysis you can do a great deal in the way of treatment. If the disease is a myelitis of the anterior horn, there will be a certain amount of permanent paralysis left in every case; but there will be a large amount of spontaneous improvement from the primary paralysis, and you can effect still more improvement by means of electricity, using either the galvanic or the faradic current, or both. In the case of peripheral neuritis, however, an excellent recovery can be made if treatment with galvanism and faradism is instituted from the onset. I should say unhesitatingly to every person who brought me a child affected with peripheral neuritis within six months after the onset, that the prognosis was excellent. In none of these cases of myelitis of the anterior horn or of peripheral neuritis should you worry yourself for one moment about the possibility of any intellectual impairment. There will be none. I have said to you again and again, since Byron went through his brilliant career with a club-foot caused by a poliomyelitis; since Walter Scott delighted his own generation and all subsequent ones with his peerless works of fiction and his poems; and since the present Emperor of Germany is entering upon his magnificent life with an atrophied and shrivelled upper extremity from the same cause, I think none of us need worry very much about possible mental difficulties in our patients of this class.

I want, furthermore, to show you in these cases other radical differences in the type of the paralysis. We will first take the case of hydrocephalus with the enormous head. You see that the child cannot walk and cannot hold itself erect. It is three years and ten months old. Although she can use the arms and legs in lying upon her back, she cannot hold herself erect and cannot use her legs and hands for any purpose. There is no paralysis in the absolute sense. A reflex act goes on in this child all right, but an intelligent movement of the muscles is impossible, because of the vast amount of fluid that is arresting the development of this brain. Children affected in this way can do pure reflex acts that require no intellectual effort, but they cannot perform any acts that do require it. This little fellow cannot move his hand at all, nor can he use his arm; he can just move the fingers a little; and cannot do a conscious reflex act. He, therefore, represents the pure type of spinal or peripheral paralysis. Furthermore, this little man's paralyzed limb is markedly atrophied, all the contours of that arm and forearm and of those thumb muscles being entirely obliterated. There is the flat hand like an ape's, the so-called "ape's hand," due to atrophy of the muscles of the ball of the thumb. There is the perfectly flat forearm and wasted shoulder. In this case of cerebral trouble from pencephalitis, the contour of the muscles is perfect, and there is no atrophy whatsoever. Moreover, in the spinal case the paralysis is a flaccid one. The arm springs like a flail. You cannot swing the leg in the cerebral case with anything like the free and flaccid movement of the spinal case, as there is a certain amount of stiffness and resistance about the former. Then, again, attempt to bend the limb of the spinal case, and you are not met with the slightest resistance. It is perfectly flaccid. Attempt to bend the limb of this little girl among the cerebral cases, and you are met with a wax-like resistance, such as you would imagine might be felt if this limb were wax and half melted down. In the spinal case, therefore, the atrophy, the loss of contour of the limb, the flaccidity of the paralysis, and the ease with which you can impress movements at will upon the paralyzed limb are the salient characteristics.

In the cerebral case, preservation of the contour of the limbs, denoting no atrophy whatsoever, the slight wax-like resistance with which the movement of the limbs and joints are met, and the inability to have the leg hang like a flail are the salient characteristics. So it becomes a very easy matter to make a diagnosis in these two groups without going into all the details. Exactly as you know the difference between a man and a woman even in seeing them pass on the

other side of the street, so you ought to know the difference between the cerebral type and the spinal type of paralysis when you look at a group of cases like these. You see a very young child come here with a paralyzed flaccid and atrophied limb, with flail-like movement of its joints, and you can at once ascribe the paralysis to spinal lesion or lesion of the peripheral nerves; and as a lesion in children of that age is most likely to be in the anterior horn of the spinal cord, you can so diagnose it. If you see a child come in smiling with the inanity of this child here, and it cannot and never has been able to walk, and the limbs are not atrophied, and when you watch them in repose they are drawn up and moved spontaneously, and you cannot observe the child make other than a purposeless action, you can say that is a cerebral type of paralysis, due to porencephalitis, meningitis, hemorrhage, or hydrocephalus, in all of which the prognosis will be about the same as regards both the use of the limb and the intellectual impairment. Study all those different cases, make a photograph of them in your memory, form a kindergarten picture of it, that you will at all times be able to bring before your mind.

Furthermore, I want to show you certain clinical characteristics of the mode of onset. The mother thinks this child was born in this condition of helplessness. It was never able to do anything for itself, and never could be educated or taught many other things that children are taught. The labor was three or four hours in duration, and there was no instrumental delivery. There is no history of any maternal fright during the pregnancy. So you see that in the external causes there is absolutely no excuse for any lesion in this child's brain. While porencephalitis is a very difficult matter to diagnose, I lean very strongly to the belief that you can make a diagnosis of it in such a case as this, in which there would seem to be necessarily some intracranial process of foetal life independent of a peripheral cause.

This other child was born at full term, delivered, after rather a tedious labor, with instruments which made cuts upon the face not healing up until the child was about three months old, and simultaneously developed brain fever, after which its head began to enlarge. According to the mother's statement, the size of the head seems to vary. For almost a year it ceased to enlarge, but recently it has increased rapidly in size. There is no history of tuberculosis, and we can get very little light upon the cause of this enormous increase of fluid.

This little child is three and a half years old. He is one of twins, he being the second born. It was a tedious labor, though no instrument was used. The child has never walked. His twin brother

walks well and has done so for nine months. The child cannot talk intelligently. I want to call attention to the fact that in this little fellow there is a different tension of the muscles from what there is in that first case over there of the spinal type, or in the paralysis of peripheral origin. I want you to notice with what difficulty and spasmodic efforts this child walks. Then I want you to notice the tendency there is for its lower extremities to cross one another, which is a curious clinical characteristic of this form of paralysis in which there is a well-marked spastic element. Then I want you to observe the condition of the reflexes. Tapping upon the quadriceps extensor of one leg, you see that the knee jerks forward with no very accurately-measured motion, but with a spasmodic quickness about it that is abnormal. On the other side this knee-jerk is normal. Then I want you to observe the difficulty with which this limb will allow itself to be bent. You feel, when you impress a sudden movement on the limb, that there is a band-like resistance meeting your hand. That band-like resistance cannot be voluntary, because you see that the child cannot control its legs enough to walk on them, or to make any purposive movement with them. Now I want you to examine the flaccid case, the spinal case.

It is of enormous importance to know how to recognize involuntary muscular resistance, to which is given the technical name of *contracture*. After feeling that, we can all detect the distinction between it and voluntary muscular resistance. You must not confound *contracture* with *contraction*. A *contraction* is where the joint is locked by ankylosis, while *contracture* gives you either the band-like, iron-bar resistance of the first child or the flaccid, wax-like resistance of the second child; and those are two beautiful illustrations, as beautiful as I ever saw in my clinical experience of the two extremes of *contracture*. Now you know what contractures are. They are diagnostic of the cerebral affection in every instance in children, and you therefore do not find them in this spinal case at all. In every case, therefore, of a child under three years of age in whom you have paralysis, and in whom there is *contracture*, you may by that alone make a diagnosis of more or less brain lesion.

I think, gentlemen, that you have seen about as thoroughly as it lies in my power to show you in an hour the different forms of paralysis in children, and the clinical characteristics of these different forms. A great deal of stress has been laid of late years upon the diagnosis by means of electricity, especially in the spinal cases. The diagnosis by means of electricity involves a very elaborate explanation of the

method of application, of the different currents and their physiological action and their reaction upon diseased nerves and muscles. I can only say to you in general terms that in spinal diseases you can throw great light upon prognosis by electrical examination, and you can do a great deal in the way of therapeutics. But in cases of a cerebral type in young children, electricity is valueless either for prognosis or for treatment, with the single exception of a few cases in children of hemiplegia without much mental impairment and seemingly due to a hemorrhage into the basal ganglia. As to the different form of current that you will find of use in the spinal and the peripheral nerve cases, there is no choice between the galvanic and the faradic, although both should be employed. The galvanic seems in these spinal cases to have a direct power of improving the nutrition of the muscles, and the faradic current, if I may so express myself, seems to have a distinct power in improving the nervous control of the muscles. What I mean is this: That if in these spinal cases you employ the galvanic current to an atrophied muscle, you will see the muscle improve in bulk. If you apply the faradic current to the nerve leading to the muscle, you will find that the return of contractile power in that muscle is much quicker than if you use the galvanic current. The static form of electricity has never seemed to me to be of the slightest use. It does not seem to have any advantage over the faradic current. I know of no internal medication that is of the slightest use in these spinal cases. A myelitis of the anterior horn, the essential characteristic of which is a destruction of the ganglionic cells of gray matter, cannot be effected by the use of any medicine, and never will be until we find a medicine that will resurrect a dead ganglionic cell and put it back in the anterior horn. In the cerebral type of cases, as I have said, the galvanic and the faradic current are of very little use except as *placebos*, unless you get one of those rare cases in children where the hemiplegia seems to be due to a hemorrhage in the internal capsule running through the basal ganglia. In such a case a faradic current will be of very great use, while a galvanic current will be of no use at all. I have known some of these cases of hemiplegia to remain stationary for six months or a year after the original onset, and in a few days make with the faradic current an improvement that was startling.

CHOREA.

A CLINICAL LECTURE

BY SIR DYCE DUCKWORTH, M.D., LL.D.,

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GENTLEMEN,—I bring before you to-day the subject of chorea, or Saint Vitus's dance. It has been well illustrated for us in my female Ward Elizabeth, wherein no fewer than four cases have been admitted since the 20th of November last. For months together we are sometimes without a single example of this disorder in our wards, and then we have a series of cases in succession.

CASE I.—The first case was that of L. E., aged thirteen, a school-girl, admitted November 20, 1890. It is interesting to note that three of these cases were of the same age. She is described as a bright-looking, intelligent girl, of cheerful disposition, tall and well-developed, and well advanced in her studies. She is not anæmic. She has brown hair, dark eyes, equal pupils. She has marked choreic movements,—makes grimaces, and throws the limbs of both sides freely about. The tongue protrudes with a sudden snap. She cannot carry her finger to her nose or approximate the two forefinger tips. She is unable to feed herself. She has not menstruated.

The history was that eight months previously she had lost her father, and was much distressed. Here we have a combination of shock and deep emotion. Soon afterwards her mother noticed jerking movements of the head and eyes. Six months ago there were movements in the limbs, but these have become worse during the past three weeks, during which time a brother has been very ill. Since the first jerking movements she has occasionally had rheumatic pains. Speech became affected a few days before admission.

Three years ago this girl suffered from chorea and rheumatic pains, and attended the London Hospital for five months. Here is an illustration of recurrence. There is no history of rheumatic fever. She was always a delicate, excitable child, but never had any fits.

The family history is of great interest. A neurotic element comes into it first from one grandfather, who died insane. The father died at forty-four, of bronchitis and asthma. The mother had had rheumatic fever twice, and chorea at the age of ten years, but has no cardiac disease now. A maternal aunt had chorea and heart-disease, and died of dropsy. The maternal grandmother had rheumatic fever. There are six brothers and sisters living, one boy having had rheumatic fever twice and chorea three times. Three young children died in convulsions.

The heart's apex was found in the left nipple line, and a systolic blowing murmur was audible there, in the axilla, and over the whole back. The pulmonary second sound was accentuated, the aortic sounds clear. Pulse regular, rather sudden, and of good tension.

No other abnormalities were detected. The chorea was very violent, and the patient had to be fed regularly. Treatment was by arsenic. In a week there was marked improvement. The arsenic had to be suspended on two occasions on account of gastric pain. The cardiac murmur grew less loud and was hardly audible behind. By January 16 the movements were almost quite subdued.

CASE II.—N. F., aged thirteen, a nurse-maid, was admitted on November 21, 1890. Four weeks ago she got cold from cleaning stone steps, and had swelling in several joints. Two weeks ago choreic movements were first observed. Speech became affected on the fifth day, and inability to articulate has since developed. The catamenia have not yet appeared. She has always been rather excitable.

Six years ago she had what was called "low fever," and was laid up for a month. Two attacks of chorea followed this. There is no history of rheumatic fever.

Now note the family history in this case. The father had rheumatic fever eighteen years ago, but has no cardiac disease now. Two paternal uncles and the paternal grandmother died of heart-disease. The mother is healthy.

This girl is excitable and emotional. She is well grown and has an intelligent expression. Her complexion is bright, hair dark, eyes gray, pupils equal. She has no anæmia. The choreic movements were very violent at first. The skin acted freely, and the perspiration was sour-smelling. The temperature was a little raised on admission, —101° F.

I will mention here that the temperature in chorea is commonly normal. If it be raised, it is generally in connection with some inflammatory complication, such as endo- or pericarditis, or some overt

rheumatic affection. It is usual to take the temperature in the rectum, for obvious reasons.

On examining the heart, the apex-beat was found in the fourth left space outside of the left nipple. A presystolic thrill was felt here. On auscultation presystolic and systolic murmurs were heard. The latter was not conducted behind. The pulmonary second sound was accentuated, the aortic sounds were clear.

Other organs were natural. There was effusion into both knee-joints and pain in the left ankle-joint,—an obvious rheumatic arthritis, —and hence the pyrexia and sweating. The knee-jerks were present and not exaggerated.

This girl was unable to speak for five days. At this time she was improving in all ways. The treatment consisted in the employment of salicylates, and subsequently arsenic was given.

By the first of December the effusion in the joints had passed off. After this time there was a slight increase in the choreic symptoms, and the lips became chapped, a very characteristic condition in this disorder.

Progressive improvement occurred, and the patient now sits up daily, all movements having disappeared.

CASE III.—A. H., aged thirteen, was admitted on the 19th of December, 1890. She is a school-girl, but was laid up for a month before admission with rheumatic pains, but no articular swellings. The first choreic movements were observed on the 13th of December, chiefly on the left side. She has spoken very little for some days. The catamenia have not yet appeared. No rheumatic history was obtainable in respect of the family. This is no proof that there is no such taint or diathesis, only no history of any gross rheumatic disease can be obtained. Such history is often not to be had in the higher classes, and it is even harder to obtain among the lower orders.

The heart's apex was found in the fifth space in the nipple line, the impulse being forcible. At the apex a loud systolic murmur was audible, heard in the axilla, but not behind. Pulmonary second sound accentuated, the aortic sounds natural. The urine was healthy. Knee-jerks were not exaggerated. Later on the systolic murmur became musical. On about the 27th of December the temperature began to rise and rheumatic pains came in several joints, which was not much affected by salicylates. On the 29th her temperature rose to 102° F. Pain in the left side of the chest was complained of, and pericardial friction detected on auscultation. On January 1, 1891, there was still audible a loud friction. This had much subsided by the 9th. The

systolic apex murmur was now heard at the lower angle of the left scapula. The choreic movements have almost subsided.

The rheumatic element was certainly well pronounced in this case, and the pyrexia was due to renewed rheumatic activity.

CASE IV.—The fourth case I have reserved to the last, though it was admitted the third in order. I regret to say, it proved fatal. This patient, F. M. S., aged sixteen, came in on the 5th of December. She was a box-maker.

The history is instructive. Her mother believed that there had been slight fidgety movements for some weeks previously. Five weeks ago she had had a tooth removed without an anæsthetic, and after this the movements were observed to be greater. They were very violent on admission. She spoke very little.

At the end of August she had rheumatic fever, and was laid up for three weeks. The catamenia appeared once six months ago, but not since. She had had no previous attack of chorea.

The family history disclosed the fact that the mother had had rheumatic fever twice since the birth of this daughter, and also that she had suffered from chorea with rheumatism at the age of sixteen years. One maternal uncle had also had rheumatic fever. The father had had rheumatic fever twice since the birth of this daughter. The paternal grandfather had also suffered from it.

On examination the respiratory movements were found to be irregular. The heart's apex-beat was felt in the fifth left intercostal space inside the nipple line. No thrill was perceptible on auscultation, but a soft systolic murmur was heard at the apex. The pulmonary second sound was accentuated. The pulse was 120, of fair volume, but slightly irregular in rhythm. The abdomen was natural.

On the knees, malleoli, and elbows were abrasions caused by the violent movements. The knee-jerks were apparently rather increased in activity. The plantar reflexes were brisk. (I may remark, parenthetically, that the latter are sometimes rather in abeyance in cases of chorea.)

This patient was placed on a water-bed, and was ordered ten grains of chloral hydrate at once, to be repeated in four hours, and subsequently thrice daily. Milk, beef-essence, and wine (3vi) were given. Four minims of liquor arsenicalis three times a day were also prescribed.

The effect of the chloral was scarcely appreciable. The movements continued with great violence and energy, especially when there were any by-standers. There was very little sleep obtained.

The chloral was given every two hours in ten-grain doses with better effect. The pulse was 140 on the 7th of December. The cardiac murmur was unchanged. The temperature, having been below 98° F., reached normal on the night of the 7th. The report on the 9th was that more sleep had been secured, movements quieter, but voluntary power greatly impaired. The grasp of the hands was very feeble, and there was much difficulty in protruding the tongue. The temperature rose to 99.6° F. this morning (December 9).

There was a worse report on the following day. There had been little sleep, and a noisy, restless night had been passed. The patient had bitten a piece out of the medicine-glass. The elbows were severely rubbed. The hands, elbows, and knees were all secured in cotton wool and bandaged. On the 12th the patient was very wild and noisy, threw herself out of bed, screamed a great deal, but was seemingly rational when spoken to. The tongue was dry, with sordes on it and on the teeth. The temperature was apyretic. During the last few days full doses of chloral and bromide of potassium with henbane and cannabis indica had been given, with imperceptible effect. Several hypodermic injections of morphine (gr. $\frac{1}{2}$) were also administered, and the pupils became contracted and some deep sleep was obtained.

This poor girl was now kept on mattresses on the floor of the ward, and her movements were restrained by the nurses. The pulse continued regular, 150 in the minute. Chloroform was administered on several occasions in conjunction with the morphine, to secure sleep, and this was obtained for eight hours continuously.

On the 13th the temperature reached 101.4° F., and the pulse-rate remained as on the previous day. The skin was dry and harsh. At night the temperature rose to 102° F. Chloroform was given at intervals, and bromide of potassium was ordered in drachm doses every two hours. On the 14th there was evident wasting, and the patient was becoming cyanosed; motions passed involuntarily. Death occurred suddenly this evening.

On the next day, at the autopsy, no organ was discovered to be changed except the heart. The mitral valve had three cusps, the smaller curtain being divided into two still smaller ones by a gap. This condition may have been due to a former, possibly a congenital, attack of endocarditis. On the auricular surface of the valve along its edge was found a continuous row of beaded thickenings. Some doubtful thickenings were present in the tricuspid valve. The cardiac muscle was pale.

In the brain there were no signs of embolism apparent to the naked eye, but both the brain and spinal cord were reserved for further examination.

This case illustrates the most serious manifestation of chorea. We do not, happily, often meet with them. I have not seen so many cases of fatal chorea in the last twenty as I remember to have seen in the previous ten years. I am not prepared with an explanation of this fact, if it be a fact, unless, as was suggested by my colleague Dr. Andrew, it be due to the recognized value of chloral hydrate, which certainly has in most instances a remarkable controlling power over the worst motorial features of the disorder. Chorea commonly proves fatal to those of either sex who have just passed the onset of puberty. You may generally feel less anxiety about cases in persons younger in age.

An indication of the rheumatic nature of chorea may be gathered from the fact that the disorder particularly affects the young, and manifests its severest features in them, becoming both less grave and less frequent in advancing years.

Chorea is a well-marked disorder. When you have once grasped the features of a characteristic case, you are little likely to mistake them afterwards. You note that I do not call chorea a disease. With Dr. Broadbent, I regard it as a symptom and not as a disease.

It is a disorder of early life, more cases occurring before puberty than subsequently. The female sex is more liable to it than the male. Rarely it occurs in adults and in old persons.

How will you recognize it? The first symptoms may be best described as fidgets which occur in the fingers or hand and arm of one side of the body. Disorderly movements fine and coarse, often at first unilateral, characterize an early stage of chorea. Afterwards both sides are involved. Hence a case of general chorea may have been at one time an example of hemichorea. The face, tongue, and trunk take part in these disorderly movements. In mild or slightly marked cases, the disorder amounts to little more than fidgety, jerking movements of the involved parts. In the graver forms, the patients may be so violently moved and contorted that an ordinary bed no longer suffices to hold them in, and they must be laid on mattresses on the floor. Paresis of the limbs of one side of the body may occur as a sequel, but is always a recoverable condition.

As I have said, the subjects are commonly children, often lean, delicate, and insufficiently nourished. They are quick-witted and bright-eyed, and might, not inaptly, often be described as "nervous"

as opposed to "phlegmatic" in temperament. Sometimes cases occur in apparently healthy children. I have not noted anæmia to be specially marked, as did Trousseau.

The literature of chorea is large. The subject has attracted much attention during the last thirty years. In your text-books you will find it stated that chorea has extensive pathological relations. By many authorities it is regarded as a disease dependent on a variety of causes. Few, if any, venture to view this disorder as a manifestation of but one morbid state.

Among the determining causes commonly enumerated you find the first place accorded to rheumatism. Next, rheumatism with pericarditis or endocarditis. After these come overwork, anxiety, sudden fright, and emotion.

The thesis that I shall try to prove is that chorea is a manifestation of the rheumatic habit or diathesis, determined, or precipitated, oftentimes, by some sudden emotion, as fright, or occurring sometimes without such recognizable determinant. This is no new view. Eight years ago I put it forth. It is by no means generally accepted, nor is it in every case possible to set out unequivocal proof of the truth of it. All I can say now is that the more of the disease I witness the more convinced I feel of the truth of the view I take.

I believe that all observers are now prepared to agree that rheumatism holds, at any rate, the first place in the etiology of chorea.¹ This is, in itself, a large admission. How about the four cases I bring forward to-day? In every one there was a rheumatic history or proclivity.

Two years ago Dr. Herringham and Dr. Garrod recorded each eighty cases of chorea with reference to their antecedents.² Both found that in the majority there was a rheumatic history. Dr. Garrod especially noted that some cases occurred in members of families who, although not having suffered from overt rheumatism, had obvious rheumatic disorders, and this is a point of prime importance. Such knowledge as is available from other statistics relating to this point gives roughly a history of rheumatic antecedents more or less marked in one-third of all cases. This proportion falls, I believe, very far short of the real truth. It is probable that the inquiries made respecting rheumatic tendency have related much too exclusively to overt

¹ A connection between chorea and rheumatism has been noted for about the whole of this century.

² Transactions of the Royal Medico-Chirurgical Society, January, 1889.

articular ailments, such as rheumatic fever, and have had insufficient regard to other ailments which, though not articular, are nevertheless unequivocally rheumatic in their nature.

The theory of chorea which claims for this disorder embolisms of minute cerebral arteries is one which must ever be spoken of with respect in this place. It was to the acumen and ingenious views of Kirkes, physician to this hospital, whose pupil I had the honor to be, that this theory was due. Dr. Hughlings Jackson supported it, and another pupil of this school, Dr. Tuckwell, of Oxford, threw additional light upon it. You see that this view presupposes endocarditis, and that particles of fibrin are shed off from the inflamed valves and driven into the small vessels of the corpora striata. It is not doubted that chorea may cause endocarditis, and no one will pretend to distinguish a choreic from a rheumatic form.

This theory of embolism as a cause of chorea is now discarded. It is certain that a few fatal cases, on examination, have been found associated with this lesion, and I have known hemichorea to come on in the course of rheumatic fever with mitral valvular inflammation, due, as I believe, to embolism, and recovery to ensue; but such cases are quite exceptional. If this theory were correct, it should always be the true one. And in any case, how is proof to be secured that the plugs found in the small vessels are not arterial thrombi and not due to embolism? It would be truly remarkable if this embolismic tendency was confined to the cerebral vessels only, and equally common sites for such impactions—*e.g.*, the spleen and kidney—remained free, which indeed is the case. Again, in vegetative endocarditis with embolism one does not meet with chorea.

One thing is certain, that whatever the etiological disturbing factor, the phenomena of the disorder remain the same. The heart is involved equally whether the case result from shock, emotion, rheumatism, pregnancy, or what not. My argument for chorea being a manifestation of the rheumatic habit of body is as follows: It being allowed that fully one-third of all cases is connected with rheumatism, more or less fully expressed, we have to account for an etiological relation for the majority. It is not easy to believe that fright, shock, or pregnancy should induce a disorder precisely similar to, or at all events practically undetectable from, chorea; further, that any of these causes should induce a form of endocarditis also indistinguishable from that due to rheumatic influence. It is easier to believe that these exciting causes should so act, and evoke in persons of the rheumatic diathesis a train of symptoms uniform in all cases.

For my part, I am not only convinced that all the endocarditis associated with chorea is truly rheumatic, but I believe that the disorder is, as a rule, mainly, if not quite exclusively, one dependent on the rheumatic habit.

I do not expect, in every case, to produce evidence of unequivocal character, to the effect that rheumatism, as commonly recognized, is present, neither do I expect always to gather proof of the same in the family history of the patient. I am satisfied that many rheumatic ailments exist apart from articular troubles, and that where the latter have not yet occurred they may appear subsequently in the life-history of the individual.

Let me remind you of some of the best-marked characters pertaining to rheumatism. It is specially a disease of motor structures, affecting the heart and joints. The nerve-centres for the heart are in the medulla oblongata. Those for the joints are believed to be located in the same portion of the encephalon. Rheumatism is apt to recur, and so are rheumatic manifestations.

Let us inquire next what may be affirmed respecting the evolution of chorea in members of a rheumatic family. The disorder may occur either during or after an attack of rheumatism, or, again, it may appear long antecedent to such an attack. Yet again, it may occur in persons whose family only have had attacks of rheumatism. Choreia, like rheumatism, is an affection in which great nervous motor centres are involved. To my mind it is not hard to conceive that a common kindred vulnerability or susceptibility in the great motor centres should predispose to one or other, or both of the disturbances known as chorea and rheumatism. This susceptibility, or instability, may therefore be, and I believe is, a part of the diathetic proclivity of rheumatism; and, given this state, an overt rheumatic attack, or some other peripheral irritant—fright or emotion, intestinal or utero-ovarian irritation—may suffice to evoke the peculiar perverted action of the motor centres. I come now to declare my belief that it is in some such mode that chorea arises as a symptomatic disorder; that it is the outcome of a motorial neurosis.

The nervous theory of rheumatism itself is not new. Addison was wont to bring forward many facts in favor of its being primarily a disease of the nervous system, and my own belief is strongly set in this direction, for I accept the arguments in support of a basic arthritic diathesis, or potential state of certain nerve-centres, from which, under certain conditions, may be evolved either rheumatism or gout.

But I none the less accept the associated humoral conditions,

although I believe that these in themselves are insufficient to explain all the phenomena of these states. I term these conditions, therefore, neuro-humoral. I believe that there is a peculiar basic or fundamental condition—a neurosis, if you will—which is capable of hereditary transmission or transformation, in the subjects of which may be set up at one time rheumatic, and at another choreic, manifestations. This view will explain many cases of chorea in which, even after skilful inquiry, no history of rheumatism, personal or family, can be obtained. The rheumatic evolution has not occurred; but the central motorial instability has given token of its presence in the form of chorea. The future life-history of some of these so-called non-rheumatic cases shows that rheumatic manifestations may supervene later, thus confirming the connection. If we accept this view, it is not difficult to conceive, further, that eccentric sources of irritation may excite chorea in subjects thus predisposed to motorial instability. Some light is also thrown by this theory on the value of arsenic in chorea. It is recognized as a most useful remedy in many cases of chronic rheumatism, promoting better nutrition and a more stable condition of the nerve-centres; and thus it counteracts the conditions on which these states mainly depend.

The general principles of treatment of patients suffering from chorea may be summed up as follows: secure as much repose and sleep as possible, feed with plenty of suitable nourishment, and, as a rule, employ some wine.

In bad cases, feeding by the nasal tube or by rectum may be necessary. In no case can the patient be allowed a knife and fork. Spoon-feeding is essential. Solid food is not permissible, because it is often bolted by choreic jerks before being masticated.

A quiet room and quiet attendants are requisite. We often lay down a carpet in a ward in which there is present a severe case.

For drugs, I have already alluded to arsenic as of great value. For the general condition of nerve-centres on which chorea depends I will not hesitate to pronounce it *summum remedium*. For the control of the motor disturbances I know of nothing better than, and of nothing equal to, chloral hydrate. I have often employed trustworthy preparations of conium, and pushed them in large doses (3i to 3ii of the succus) twice or thrice daily, without finding any very noteworthy good or ill effects. Zinc sulphate has some repute, and so have preparations of iron. The late Dr. Radcliffe employed morphine and alcohol in full doses, even for young children, with, as he believed, the best effects. I am not satisfied with the results, nor with the desira-

bility of such medication. Of strychnine, as recommended by Sir Alfred Garrod, I have a much higher opinion, and have witnessed good results from its employment.

Should any overt rheumatic symptoms present themselves at the outset or in the course of a case, you will do well to employ treatment by salicylate salts as for ordinary rheumatic fever. Cardiac complications require no further attention than you would bestow on them under other circumstances. If such be, as I am convinced they are, rheumatic,—whether involving the pericardium, valves, or endocardium,—what other line of treatment could you adopt? I commonly apply a small blister to the præcordia when there is evidence of pericarditis, and I believe the practice to be a good one.

Subsequent feeble health and anæmia demand a good dietary, with cod-liver oil, iron, quinine and strychnine, and suitable change of air.

Relapses are not very infrequent, and the chorea may return again and again at longer or shorter intervals.

I have never met with chorea as symptomatic of intestinal irritation, whether from lumbrici or from constipation, though I must add that I have been induced to give a few doses of *santonin* at the outset of some cases, to make sure that such irritation was not to be blamed.

What is to be said, lastly, respecting the prognosis and the duration of cases of chorea? You may fairly expect a complete recovery in the great majority of patients thus affected. As often occurs in diseased conditions, the case may be mild, more severe, or very grave. Many of the latter ultimately recover. The unfavorable influence of puberty I have already mentioned to you, and another malign one is probably to be found in such cases as are neurotically predisposed. In the latter there are additional factors of nervous instability. In a few weeks, from six to ten, you may fairly look for complete recovery in the majority of cases. Dr. Andrew found that the average duration of a large number of his cases was ten weeks and three days.

Before we separate, let me pass round this specimen of the heart from the fatal case I reported to you. It well illustrates the condition of the mitral valve most commonly witnessed in such instances. There are no brittle, fibrinous vegetations, you see, attached to the inflamed edges of the valve, such as might be looked for there if we sought a source of embolisms. In my experience we do not find associated with chorea that form of endocarditis known as vegetative or proliferative.

Whether or not you accept the doctrine I have ventured to teach in this lecture, you cannot fail, if you ponder on the matter, to derive advantage from a study in this direction. A false theory is sometimes

a good stepping-stone towards a true one. In any case the treatment I have recommended will hardly fail to help your patients, and I trust you will none of you, in your after career, be so foolish as to hold your hands altogether in ministering to your patients because you have no exact theory on which to found your therapeutic efforts. Our first business is to bring aid and comfort to our patients, and to do this by the light of the best knowledge of the times in which we live and act.

Neurology.

THE REMOTE EFFECTS OF TRAUMATISMS AS SEEN BY THE NEUROLOGIST.

TWO CLINICAL LECTURES DELIVERED AT THE UNIVERSITY HOSPITAL.

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LECTURE I.—TRAUMATIC SORE BACK—TRAUMATIC HYSTERIA.

GENTLEMEN,—The case which I have to present to you this morning is that of a master-builder who, on the 14th of June last, was struck on the lower part of his back by a very heavy beam that had fallen about nine and a half feet. The man fell unconscious, but recovered shortly, and since the accident has suffered from symptoms similar to those which he now has.

I consider myself fortunate in having this case to show you, because it represents a large and interesting class of patients, a class which owes a special importance to the fact that in most instances some one is responsible for the injury received, and therefore lawsuits and medico-legal testimony are usually involved. Wherever there is expectation of payment after such injuries, there exists a strong motive for simulation of disability and for exaggeration of symptoms. Moreover, when there is no purposive attempt on the part of the patient to defraud, it is hardly possible that he should escape the influence of self-interest, and especially of the procedures which accompany any attempt to recover damages. The perpetual dwelling upon the subject, the frequent conversations concerning it, the attentions and examinations of experts, the talk of lawyers, and various similar actions which grow out of legal proceedings, must have a strong tendency to intensify all symptoms. The so-called "expectant attention" not only aids in the cure of an hysteria or of other nervous manifestations, but may also act towards an increase of symptoms. In the case which I have before you to-day, the injured man is a master-builder, who was hurt whilst carrying out one of his own contracts.

He is himself the person who would be responsible for the injury, and has therefore no pecuniary interest involved in the matter.

Although a single case may seem a slender text on which to hang so long a discourse, I shall use it for the purpose of introducing to you a general discussion of the disabilities which follow traumatisms of the trunk, and shall take the liberty of describing to you various cases from my private and public note-books as illustrations of the different results which may follow such injuries.

Clinical experience proves that blows upon the body or upon the head, and also violent shakings or general concussions of the body without actual local violence,—such shocks, in other words, as sometimes happen in railway accidents,—clinical experience proves, I repeat, that these injuries may produce: first, local injuries and inflammations at the seat of the blow; second, traumatic hysteria; third, the condition which has been called railway spine, and spinal concussion, and which, for lack of a better term, I shall denominate “traumatic neurasthenia.” The first two of these conditions may exist alone, or in connection with each other or with the third state. Probably in the third condition there is always more or less hysteria, and usually some local injury. I propose to consider separately each one of these results, with sufficient detail to guide you in your practical management of cases hereafter.

In considering the local effects of trunkal injuries, I shall pass by all those—such as broken bones, lacerated flesh—which are at once obvious to the observer, and which fall directly within the province of the surgeon. There are, however, not a few cases that come under the notice of the neurologist, which are the result of direct violence to those portions of the peripheral apparatus immediately connected with movement. Most of you are no doubt familiar with the condition known as concussion of the brain, but perhaps it is not so generally recognized that an allied suspension of function may occur in nerve-trunks and also in muscles, although it is uncertain in the last case how far the muscular paralysis is purely muscular and how far it is due to an affection of the terminal nerve-filaments in the muscle. In severe cases of brain-concussion there is frequently, though I do not myself believe always, a distinct organic change capable of being recognized by the microscope; and even more closely does what I would call “concussion of a nerve-trunk” ally itself to organic change. A direct blow may, of course, offer violence to any one of the external muscles, but I believe is very rarely given with sufficient force to paralyze a muscle, unless it be inflicted with a weapon or some other instrument

hard enough to tear or destroy structure. Almost the only muscle I have ever seen suffer paralysis with any degree of frequency from direct violence without evident destruction of tissue is the deltoid. I show you here, as an illustrative case, a man who was pitched forward from a wagon, alighting upon the shoulder, and who is unable to-day to raise his arm, evidently, as you see, from paralysis of the deltoid. All signs of bruises have passed away, there is no pain on passive motion, no evidence of inflammation; and yet the muscular power is gone. Probably we might well consider here the very common cases of "pressure palsy" in which continued pressure upon a nerve from a crutch, or by a head or other hard body, results in loss of function of the nerve; but I have shown you so many cases of this condition in the past that I will not dwell more on it.

Very curious and strange are sometimes the results, however, of direct accidents or blows upon nerves. As an instance of such a case, I may mention a sailor, formerly at this clinic, who whilst on watch was struck from above downward by the point of a curling wave, with the resulting paralysis of his left arm, due, according to my opinion, to the effect of the blow on the brachial plexus.

The treatment of all such cases is not hard to perceive. Immediately after the injury, absolute rest, leeches, hot or cold fomentations, and the whole array of measures with which you are familiar as used by surgeons for the purpose of combating inflammation, may be employed. After the acute symptoms have subsided, the question always to be studied is as to whether the nerve is simply functionally depressed, or whether it has been left in a condition of inflammation, or whether, perchance, it is involved in exudations which have occurred in the space about it. If a nerve-trunk be found tender, even if there be no characteristic shooting nerve-pains, blisterings are in order. If any hardening can be found in the immediate neighborhood of the nerve, the question of an operation comes to the fore. Possibly some of you may remember a case I had here last winter, in which a blow over the musculo-spiral nerve had been followed by loss of power almost complete, and in which a defined hardness could be felt at the seat of the injury. After the failure of all other treatment, I had Dr. White to cut down upon the nerve, which he found embedded in a mass of inflammatory exudation; from this the nerve was carefully freed. The wound healed rapidly under the antiseptic method, and the measures which before had failed to give relief soon brought about restoration of function.

After the acute stage of an injury has entirely passed and all in-

inflammations have been subdued, the means at our command for treatment are to be found in the use of massage, electricity, and hypodermic injections of strychnine.

Of course I do not propose to discuss the various manipulations of massage, but I do desire to direct your attention to two points concerning these applications. All surgeons recognize the fact that false ankyloses frequently occur in joints, and that for restoration of movement it is necessary that the bands of fibrous tissue be broken up. It is not, perhaps, as universally recognized that exudation may bind, in a sort of false ankylosis, two muscles together, and that a single muscle may be bound in its sheath in such exudation, or that even the various fibres of muscle may be so agglutinated that the function may be greatly interfered with. In many of these cases, one of the great objects of massage is the freeing of the muscles and the bringing about of absorption of the exudate, so that passive movements should form an important part of the manipulation: not rarely these passive movements should be gradually increased in violence until muscles are loosened one from the other and the natural play of parts restored. The second point in massage is that the manipulations act not only by stimulating the afflux of blood to the part, but also by aiding the return current through venules and lymphatics; hence the important rule that the general trend of the movements should always be in the direction of the return circulation.

Large text-books are devoted to a discussion of the proper methods of applying electricity in paralysis, and specialists talk learnedly concerning milliampères and varying currents. Let me assure you, however, that the practical use of electricity in paralysis is a very small matter; that milliampèremeters are of no real service, and that much learning has been wasted in the discussion as to which current should be selected in any individual case. Certain seemingly empirical but really scientific principles of simple character can guide you unerringly. The simple fact is that in any case of paralysis, either the rapidly-interrupted faradic current, the slowly-interrupted faradic current, or the interrupted galvanic current is to be chosen according to its effects, and that these effects may be judged of by the muscular contraction produced. In accordance with this I long since evolved what I have called the electro-therapeutic golden rule for the general practitioner,—namely, that in any paralysis he should select that current which produces the greatest muscular contraction with the least pain to the patient.

Quite apart from and yet related to the cases of which I have just

spoken are the more numerous instances in which injuries to the back result in a peculiar disability of the part. Occasionally a wrench, or a strain in lifting, is the spring of the affection I propose now to consider. More frequently the difficulty is the outcome of direct violence. Thus, in one case which was long under my care, a fractious horse reared, in the city, and fell over on his rider in such a way that the small of the back of the rider fitted into the curb-stone whilst the horse was upon him. In these cases there is usually no great tenderness on slight pressure, but deep, firm pressure immediately over the affected spot elicits marked evidences of soreness. There is usually loss of function in the part, so that, if, as is commonly the case, it is the vertebral column which is injured, there is some rigidity of the spine, with a pronounced feeling of weakness, and of actual pain upon continued exertion. If the case progresses from bad to worse, these manifestations become more and more pronounced, and superadded to them appears marked pain upon jolting, sudden movement, abrupt pressure upon the head, or any other procedure which brings a jerk or a strain upon the vertebral column.

The study as to the best method of examining these cases is not only of importance for the determination of the best way of discovering the facts of the case, but also for the determination of the best plan to fit oneself for cross-examination by lawyers. It is, in the first place, essential that the first examination be made by the consultant without the presence of the attending physician, as the opposing counsel very commonly attempts to show that the consultant has been dominated by the attending physician, and has simply followed his leading. In the second place, it is very important that the examination be made in full daylight, or in a full glare of light, as a favorite trick of counsel is to say that "the doctor only looked at this man in a half-dark room." In the third place, the patient should be stripped, even though the said patient be a woman. In the case of a woman, a female nurse should always be present, and the woman be so enveloped in a blanket that the latter can be opened behind, so that the front of the person can be completely protected from the view of the surgeon whilst the back is examined. The patient having been placed in the position of "attention," with the feet close together and parallel, should be instructed to bend forward, backward, and to each side, all the movements being carried as far as possible. Under these circumstances you will find in cases of traumatic back that the erector-spinae muscles are thrown into spasm by movement, the amount of the spasms being proportionate to the degree of soreness, and the situation correspondent to that of the sore-

ness. It is much better to judge of the restriction of movements, and of the soreness of the part, by the spasms produced, than by the statements of the patient, for it is hardly possible for the spasm to be feigned; certainly it could not be feigned except by a person who was well trained medically. It will also be found in these cases that reflex spasms are induced by pressure upon the back, by tapping the head, by allowing the patient to jar himself or herself on the heels, etc. The vertebral surfaces or attachments are inflamed, and nature protects from the irritation of movement and of pressure by spasmodically fixing the parts.

As an instance of the deleterious effects and the great persistency of these strains of the back, I may note the case of Mr. C. H. L., a Western banker, aged forty-five, who, when seventeen years of age, attempted to lift a very heavy log upon a wagon, felt a "crack in his back," to use his own words, with a sensation of "giving way," and has never been in a normal condition since. Although he continued to work on the farm, he had at once to abandon wrestling and similar athletics: and, although for many years he has been very actively employed in his business, there has been, especially lately, a progressive increase of the back-trouble. When he saw me, he could only lie comfortable, or sleep at all, in certain positions. Any violent muscular movements of the back caused great distress, and the stiff way in which the patient sat down upon a chair showed always his almost involuntary, habitual attempt to protect the back from strain or injury. If he used the back even so little as is required to drive a hard-mouthed horse, he suffered severely. Although sexual power had been almost lost and the knee-jerk was sluggish, the most careful examination failed to detect any positive evidences of disease of the cord itself; whilst the violent pain which was produced by riding over a rough road, or any similar jolting movement, showed very plainly that the vertebral column was at fault. In this case, for thirty years had the man gone on, the weak spot becoming weaker, until at last it caused almost total disability.

I have never had opportunity of making a post-mortem examination in such a case, but I have no doubt that in most, if not all, of these cases the primary lesion is an inflammation of the abundant fibrous tissues which lie about the spinal column, and not rarely this inflammation spreads from part to part until it involves the deepest structures, and in some instances probably even the intervertebral cartilages. Indeed, I have seen one case in which an osteitis of the vertebra seemed to have had an origin of this character. Again, pains

at more or less distant portions of the body may indicate that the nerve-roots are affected, either by pressure of exudation or by propagation of irritation by contiguity.

These obstinate sore backs are certainly related to the local affections of nerves and muscles following injuries spoken of a few minutes since. I have under my observation at present a connecting case. Some months ago a man was struck very severely upon the right side of the root of the neck by a projecting timber from a slowly-moving train. He was knocked senseless, and now complains of disability of his right arm. He has been examined by several surgeons, who are said to have pronounced him cured. I do not know whether this is true; certainly he does, when superficially viewed, seem to be all right; but careful testing proved that the right arm, instead of being much stronger than its fellow, is very much weaker, and, when the shoulders are brought forcibly backward towards one another, a spot of deep tenderness is found to exist at the seat of the original injury, a soreness which is also elicited by deep pressure with the fingers. I have no doubt myself that the cervical nerves were involved, indirectly probably, in the injury, and it may well be that deep in the tissues inflammatory exudate still exists and presses upon nerve-trunks. The absence of tenderness over the brachial nerve-trunks seems to show that there is no neuritis at present. If this case fail to do well under treatment, I believe it would be justifiable to cut down and, if necessary, free from their surroundings some of the spinal nerves.

The treatment in these cases of sore backs consists in the use of local rest and continued counter-irritation; the general health being, of course, steadily maintained. In the severe forms it may be necessary to use plaster or other jackets, such as are employed in Pott's disease; especially when there is reason to believe that the intervertebral cartilages are involved, as it is essential to take pressure off the vertebral column as much as possible. In one or two of these cases I have found suspension of very great help. Some of you may remember that several years ago I called attention to the fact that in the treatment of Pott's disease suspension by means of the spinal-jacket is much better than by the method usually practised. The human trunk is composed of two cones, of which the shoulders and the hips form the respective bases. The surgeon has long availed himself of this fact in supporting the upper segment of the body upon the lower, by external supports or splints, commonly called jackets. It occurred to me that, instead of hanging a man by his armpits and head, it might be possible to use the upper cone of the body for the support during

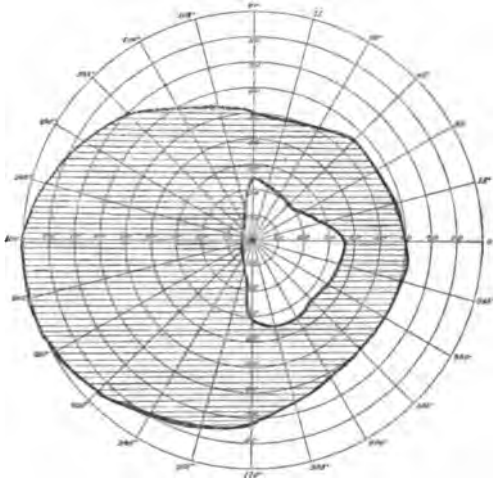
suspension. So I had shoulder-straps fastened into a plaster-jacket. It was found that in this way suspension could be borne for many hours a day, and in some cases of disease of the vertebræ themselves the results have been most extraordinarily rapid and satisfactory. The device has also served me in the treatment of one or two bad cases of chronic sore back. In putting on this form of plaster-jacket you should prepare the patient by suspension from the armpits, etc., in the ordinary way. When the trunk has been covered by the first layers of the plaster-bandage, take two broad, strong linen bandages, well wetted, and place one over each shoulder in such a way that eight or nine inches of each end of the linen bandage shall hang below the edge of the jacket (front and back); then place a number of turns of the plaster-bandage around the body so as to hold the linen bandage in place; after this turn up the loose ends of the linen bandage which hang down below the jacket and apply the plaster-bandage in such a way as to thoroughly envelop the linen bandage and complete the jacket. If the linen bandages have been thoroughly wetted, they closely adhere to the jacket and form an integral part of it which cannot be torn loose.

Passing by without further remark the subject of the local effects of blows and wrenches of the back and adjacent parts, let us now proceed to the consideration of the second division of our subject,—namely, traumatic hysteria. In doing this let me first lay it down as an axiom that, even in a person who has not been previously openly neurotic or hysterical, a very severe hysteria may result from a traumatism. How far such hysteria is due to the injury, and how far to the emotional excitement of the accident, is very hard to determine; but I am of the opinion that shock of the nervous system, independent of emotion, is sometimes capable of developing that peculiar nervous mobility which we call hysteria.

May I describe to you a case which I had some time ago, of a woman who had been injured on one of our large railways? She was scratched and bruised, and much shaken, but not thought to be seriously hurt. According to the best history I could get, before the accident she had not been hysterical, and she was a country girl with brothers and sisters altogether healthy. Shortly after the accident, however, she was taken with a pain in the back and a spasm in the extensors of the toe. This was soon followed by loss of sight, and by vomiting, which was frequent, and not rarely very violent, and at times was accompanied by hæmatemesis; headache and distress in the vertex, loss of appetite, loss of power in the legs and arms, all soon developed. She was seen by seven or eight physicians, and one of the most dis-

tinguished oculists in the country made the statement that she had secondary atrophy of the optic nerve, and the eight doctors, some of them men of high renown, agreed that it was a case of hopeless myelitis. An engagement of marriage was broken off, and the woman settled down to bear with Christian fortitude a life of permanent invalidism. I was sent for by a medical relative, with the statement that he knew nothing could be done to permanently benefit the case, but that he desired to see if I could suggest anything to make the patient more comfortable.

I found a woman of hysterical aspect, suffering from partial hemiplegia, with such a condition of the arms and legs that the relaxed soft muscles went into rigid contraction upon a little handling. There was also complete right-sided hemianæsthesia affecting the face and head, as well as the extremities of the body, with pronounced ischæmia, so that when a needle was plunged into the skin no blood flowed. The hemianæsthesia was accompanied by complete blindness of the right eye, with, in the left eye, right lateral hemianopsia and partial achromatopsia, red being the only color which was appreciated. There were also complete loss of taste in the right side of the tongue, and complete loss of hearing in the right ear. The field of vision of the left eye I have represented on this diagram. Of course there was no field at all for the right eye.



The diagnosis in this case seemed to me so extremely simple that I was at a loss to explain the

mistake that had been made by eminent and skilful men, except in that they were misled by trusting to the opinion of the oculist that there was organic disease of the optic nerve. And here, gentlemen, let me give you a warning based upon a very wide experience.

The existence or non-existence of a choked disk or similarly comparatively gross lesion of the fundus may be determined with certainty, and may be of great value in fixing the diagnosis ; but when it comes

FIELD OF VISION OF THE LEFT EYE.—The shaded portion represents the normal visual field over which blindness existed ; the inner space without shading represents the actual field existing when the patient first came under care.

to watching the color of an optic nerve, and a gray nerve or a green nerve is spoken of, *cave!* For some years I labored under the most humiliating sense of my own lack of perceptive power, because I often was not able to see the shades of color in optic nerves upon which my optical friends based a diagnosis; but when I took to sending individual patients to several oculists of renown, one after the other, with the result of getting the nerve called by different colors, and when I watched the progress of cases having these various-colored nerves, I became more reconciled to the burden of my own existence, and could at least appreciate the feelings of a headache-patient whom I once asked to go to an oculist, and got the reply, "D——n the oculists. I went to Dr. So-and-So [mentioning a man of world-wide fame] and got an opinion; waited a few weeks and went to him again, giving another name, and got an opinion absolutely opposite to the first." I do not want you to misunderstand me. Probably in no department of medicine is action so nearly reduced to a certainty as in the diagnosis and treatment of diseased eyes. This very certainty of work tends, however, to make oculists over-confident, and to make nerve specialists over-trusting: I am sure that he who habitually makes diagnoses of nervous conditions upon reports of fine changes of the optic disk will every now and then fall into a slough.

It may interest you to know upon what especial grounds the diagnosis of hysteria in my case seemed clear. In the first place, the mental and emotional condition of the patient was especially that of hysteria; then the peculiarities of the optic phenomena—the presence of amaurosis in one eye, with lateral hemianopsia in the other—was in itself very suspicious. Such phenomena, indeed, could depend only upon hysteria, or upon a gross lesion of the brain affecting primarily or secondarily both perceptive centres and nerve-trunks. I was convinced, however, from the history of the case, from the absence of headache, spasms, or paralyses exactly like those of severe organic brain-disease, that the latter did not exist. The conclusion derived from the eye-phenomena was abundantly confirmed by the coexistence of hemianæsthesia and deafness in one ear. Any organic disease which would produce such loss of sensibility and of special sense, with partial hemiplegia, must have been large enough to have revealed itself by unmistakable signs. Then, again, the condition of the reflexes was characteristic. The reflexes of organic hemiplegia are often exaggerated, but very rarely, if ever, to the extent that they were in this woman; for it must be borne in mind that a rapidly-developed hemiplegia of organic type and without trophic lesions is practically always

of brain origin, and gross exaggeration of the reflexes in a cerebral hemiplegia can result only from a descending sclerosis or other secondary change of the motor tract. For this there had not been time in the present case. Further, the prism test of vision strengthened my conclusion. You remember that the woman could not see with the right eye. All kinds of methods were taken to detect falsification of this symptom, without avail. Every test gave the response of absolute amaurosis, and yet when prisms were put upon the eyes, and the woman was told that the effect of the glasses was to make the one eye see two lines where there was only one, she saw the two lines, and not only saw them, but correctly placed them, as prisms of different angles were substituted one for another. Of course, the second image was seen with the blind eye, and, of course, it was actually seen, as its changes of position were accurately pointed out,—and yet the woman was blind in the seeing eye. You may say that this was a case of falsification or purposive deception; but not so, gentlemen; the woman *could* see, and could *not* see, out of the same eye. The eye was, as it were, both living and dead. To go into a discussion of the how and the why of this would lead us into a study of the most recondite of all subjects,—human consciousness,—but into this wilderness I do not propose to lead you, lest, perchance, forty years' wanderings should fail to bring us to the promised land of truth.

Some of you, no doubt, are saying in your own minds, undoubtedly some of the woman's symptoms were hysterical, but how did he know they were all hysterical? In most of these cases of nervous disturbance following traumatism it is impossible to separate with certainty the interwoven threads of hysteria and traumatic neurasthenia; but in the present case the pronounced and universal presence of the hysterical symptoms, the absence of the peculiar back of traumatic neurasthenia, the preservation of so much of the general strength, and numerous little indications,—floating straws, scarcely to be expressed at all in words,—led me to the conclusion that the symptoms were purely hysterical, and to a favorable prognosis. At any rate, the correctness of my diagnosis in the case was proved by the result. The woman came under treatment early in April; the last of May she renewed her marriage engagement, and in September, after a trip to Europe, was married.

Right here it is fitting for me to tell you that in traumatic hysteria the prognosis is much more favorable than in other forms of hysteria of equal severity, and this for very obvious reasons. Major hysteria developed without obvious cause almost invariably rests upon an

original vice of nervous organization. It is so ingrained that we can hardly expect to get it out of a person ; it is an entailed estate which no power of law can wrest from successive generations.

In the treatment of cases of traumatic hysteria the personal equation is decisive. It is largely a match between the character and wits of the physician and the character and wits of the patient. To be firm, to detect attempts at fraud, to be able always to answer the fool according to her folly, to know when to tighten the rein and when to loosen it,—these are essential, and cannot be taught in a lecture-room.

In the first place, there is no use at all in attempting such a case unless the patient be put absolutely under your control, and taken away entirely from her friends. Having secured this, it is essential that a nurse of the right character be found, in that as much, or even more, depends in these cases upon the nurse than upon the physician. Firmness, tact, obedience, sufficient knowledge and experience to tell when to be rigid and unbending and when to yield a little, are some of the mental and moral qualities that the nurse must possess. In the present instance the patient was isolated ; was put upon the use of a modified rest-cure ; was given the dry electric brush very freely and heavily all over the anæsthetic region ; was fed with tonics, nervines, and well-regulated food freely ; and was generally managed, browbeaten, and cajoled. One of the earliest procedures was the treatment to restore sight to the blind eye. In doing this the left or seeing eye was hermetically closed with sticking-plaster, blisters were applied to the right temple and back of the right ear, and the patient was told that the effects of these blisters would be very sure and very great, and that they would be indefinitely repeated until the desired result should be obtained. For me to have informed the woman that I believed she could really see if she thought so, and that I was only treating her to make her think so, would have been a gross blunder that would have made success impossible. On the third or fourth day the patient confessed to seeing glimmerings of light in the eye, and in eight or ten days the sticking-plaster was taken off the sound eye, with the information that the blister and the sticking-plaster would be reapplied if there were any signs of the *blindness* returning. Then the left hand was tied up, and the woman left to hunger, except as she would slowly and imperfectly feed herself with the paralyzed arm. And so the battle went on, with the result that has before been stated.

Such, gentlemen, is the history of a typical case of traumatic hysteria. As my hour is exhausted, I must leave the consideration of the last division of our subject for another week.

FUNCTIONAL NERVOUS TROUBLES: NEURASTHENIA, ITS OCCURRENCE IN YOUNG AND OLD, SYMPTOMATOLOGY, AND TREATMENT.

CLINICAL LECTURE DELIVERED AT THE NEW YORK POLYCLINIC.

BY B. SACHS, M.D.,

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GENTLEMEN,—We pass to-day to the consideration of a series of functional cases. I shall first show you cases as they occur in young men, and after that we shall take up the cases of elderly persons.

CASE I.—This man is twenty years of age, a car-cleaner by occupation, a Russian by birth. He has been at his present occupation for two years. He says that he has a number of seminal emissions at night and during the day when he goes to the closet. He has rushes of blood to different parts of the body, pains in the stomach, pains in the inguinal region of the right side, and pains in the back; at 10 A.M. he always feels tired and has pains in the back and top of the head, while brushing his hair gives him pain; his eyes hurt him a little; his bowels are all right. He tells us that he dreams a great deal; that he has worshipped freely at the shrine of Venus, having begun his sexual career at sixteen. For the last twelve months all excesses have ceased, but the emissions continue. He says he has never masturbated, but we can safely doubt this statement.

Similar histories we have to listen to frequently enough, especially in private practice. His symptoms are tired feeling in the morning, pains in the back and head, peculiar sensations in the arms and legs, a hot feeling in the testicles, a peculiar feeling in the stomach and in his eyes.

Probably there is scarcely an organ in his body that does not exhibit some sort of symptom, but a few of these are more characteristic than the others, and these are sufficient to guide us in the diagnosis.

There are two symptoms which are of special importance,—viz., pressure sensation on the top of the head and peculiar feelings in the nape of the neck. Sometimes he also has peculiar feelings in the spine. On examining him, we see that he looks a little depressed (the condition he is in makes him despondent), the tongue shows slight fibrillary tremor, and, if you ask him to show his teeth, there is a slight tremor of the facial muscles. I will ask him to close his eyes tightly, and you notice a slight tremor about both orbiculares; still he closes the eyes fairly enough. On holding out his hands, there is a slight fibrillary tremor, but not so marked as in other cases. The knee-jerks are normal.

The symptoms present in this man are the symptoms of neurasthenia. You will find that the same or very similar symptoms are present in many patients, although the cause giving rise to them may be very different. In this case there is a very distinct history of sexual excess; so we can speak of the case as sexual neurasthenia. We have much the same condition whether the neurasthenia be due to overwork or mental fatigue; also the same or very similar symptoms whether the neurasthenia be due to the excessive use of alcohol or tobacco. So we may distinguish the following varieties: sexual neurasthenia; alcohol or tobacco neurasthenia; neurasthenia from fatigue, mental or physical.

According to their regional distribution, we may divide the symptoms into a cerebral and a spinal series. In many cases the cerebral symptoms predominate, in many the spinal, and we have cases in which there is a mixture of the two sets, as in the patient before you. The depression of spirits, the pain in and rush of blood to the head are cerebral; the pain in the neck and the burning sensation in the legs and testicles are of spinal origin.

If you ask how we shall distinguish the various forms of neurasthenia, I must answer that in the majority of cases you will have to depend upon the history of the patient, but there are a few points that enable us to say almost at first sight what the condition is. In case the sexual form be present, the most prominent symptom often is the hypochondriacal depression. This man is quiet in his speech, is debilitated, and feels depressed. In alcohol or tobacco neurasthenia there are two symptoms which are almost pathognomonic, as compared with the other forms. Tremor of the hands is extremely marked, as is also tremor of the facial muscles. There is some of this tremor noticeable in this case, but it is not nearly so marked as we often find it in cases of alcoholic neurasthenia. If I see a person with marked facial tremor,

I think of two conditions,—alcohol or tobacco neurasthenia on the one hand, and general paresis on the other. It is perhaps more characteristic of the latter. In former days a number of us in this city regarded this peculiar facial twitch as absolutely pathognomonic of general paresis, but we know now that it is very common in alcohol neurasthenia. In a large number of cases of neurasthenia all the reflexes are increased; in alcoholism a fair number of cases have increased reflexes, but a smaller number have the reflexes diminished, and these are the cases in which alcoholic neuritis is apt to develop.

The neurasthenia from fatigue affects men who do too much work,—physicians who are driven day and night, and merchants who are overworked during the day and have to travel in sleeping-cars at night. We meet it also in women who have too many duties,—in teachers, in mothers who have too many children to educate, and in women who are slaves to society. In these cases you are apt to find almost every symptom under the sun. The patients complain of a sense of fatigue, of the inability to apply themselves to work, of pains through the head, and of a feeling as though there were a rush of blood to the head, but, above all, of the sensation of pressure or of heat on the top of the head. Out of thirty cases, fully twenty-five will complain of that in the first instance. Persistent headaches and insomnia are added to this formidable list, and in addition there are pains down the back and radiating into all parts of the body, burning sensations particularly, and a feeling of fatigue. Some general symptoms may be present, and I know of none more important than the feeling of being unrefreshed by sleep and restlessness in the morning after getting out of bed. These are the subjective complaints, which may be varied very much and may be added to others that I will mention.

There are objective symptoms that may be regarded as good proof of the neurasthenic condition. First, note the tremor of the tongue; sometimes a slight tremor of the facial muscles; a marked tremor of the hands, especially if the patient holds them out straight, and very noticeable if you ask him to straighten the fingers. You will notice in yourselves that, if you have lost a night's sleep, the hands will tremble in the morning. Secondly, note the behavior of the reflexes. In the majority of cases of neurasthenia, and particularly in the non-alcoholic cases, the knee-jerks will be exaggerated; it is very rare, however, to find ankle-clonus, and the wrist- and arm-reflexes are absent, as a rule. I speak of this because you will sometimes have to decide between mere neurasthenia and organic disease. You will find that exaggerated knee-jerks alone do not signify much, unless one side be

more affected than the other, which would show a unilateral lesion in the brain or spinal cord, but, when the knee-jerk is exaggerated and ankle-clonus is present, we have reason to fear changes in some part of the motor tract.

CASE II.—This man is thirty-four years old, a waiter by occupation, Swedish, unmarried, and comes because of "nervousness." He complains of weakness of the whole body, of bad taste in the mouth, brain-weariness, and inability to read very long,—not more than half an hour. He has no headache. From his fourteenth to his twentieth year he masturbated; since the age of twenty he has had intercourse with women. The man says that latterly he has been much broken down, and that he has a constant discharge of semen. Erections, which formerly occurred in the daytime, now occur only at night. He has not any pains, but has a feeling of general weakness. He has been under treatment by various quack doctors, who introduced the sound and gave medicine which to him smelt like matches,—probably phosphorus.

To state the case, then, we have a man of thirty-four who masturbated from early boyhood to his twentieth year and who is now leading a fair sort of life, but is suffering from the consequences of this early vice. His symptoms are comparatively few. He simply complains of general weakness throughout the body, and that his brain gets tired easily; but he is more particularly concerned about his sexual impotence than anything else. From the general appearance of the man you see that the condition has made some advance; he has a long-drawn face, and a pale, sallow, anæmic look. He has gastric disturbance, a peculiar taste in the mouth, and a coated tongue, which is frequent in neurasthenic states and is not due to an actual catarrh. There is no tremor of the tongue and very little tremor in the facial muscles. I have seen some sexual cases in which the tremor was almost as marked as in the alcoholic form. He has lively knee-jerks, but no ankle-clonus; notice that there is a despondency less marked than in the first cases, yet similar to it.

In regard to the treatment of these cases of sexual neurasthenia, there are no cases that are more satisfactory. I give you my own plan of treatment, and I can assure you that it has done me good service. Remembering that so many neurasthenic individuals complain of the feeling of weakness in the morning, I open the day with cold water. I find that this applies with full force to hypochondriacal conditions. The cold-water treatment in the morning is apt to bring about a very beneficial change in the general system.

I will suggest various methods of applying this treatment, which

you can use in all cases, whether rich or poor, old or young. The top of the head and nape of the neck are the points of attack. Have the bath-tub fully one-third full of luke-warm water, so that the patient can stand in it without getting chilled, then if the bath have a douche attached to it, you can allow the shower to play on the top of the head, and then down the nape of the neck and spine ; or you can either simply slap the nape of the neck and spine with towels wrung out of very cold water (these can be applied by wife, relative, or friend). If there be no one about and the patient be alone, let him take a large sponge dipped in cold water, put it on the top of his head and let the cold water run down his back. Nothing produces so good an effect on the nervous system as the trickling of cold water ; it is not so good to simply wash with the water. So, trickling out of a sponge is the proper way to apply cold water in the morning. No matter what the origin of the neurasthenia may be, it is best to begin it with this cold water treatment. In addition to that, all these patients require nutritious food, consisting largely of eggs, meat, fish, and oysters, and, if you can get them to take it, large quantities of milk, with a slight admixture of farinaceous food. In addition to this, the patients will require rest or diversion. If the case be one of mental or physical fatigue, rest is called for ; but in cases where there is a marked hypochondriacal condition it is not so. Here rest is not so important as diversion ; it is a great mistake to have these hypochondriacal neurasthenics undergo the rest-cure ; that makes things more favorable for the propagation of the hypochondriasis. But, above all things, these patients, one and all, require tonics, and there is no disease in which drugs are of more service than in this. There are two drugs of the greatest importance,—first, strychnine, and, secondly, phosphorus. Arsenic is favored by some, but I have not seen a case where I have needed it. I often see cases where strychnia is needed badly. You can give any of the salts of strychnia or the preparations of *nux vomica*. The former are to be preferred. The proper way to administer the drug is in pill form or in mixture. Begin with one-sixtieth of a grain three times in a day ; if the patients tolerate strychnia, the dose should be increased until the patient takes one-thirtieth, or one-twentieth, or even one-tenth of a grain three times daily. The more the exhaustion, the better the strychnine is tolerated. With regard to phosphorus, we can use it in combination with the strychnine, or independently, giving from one one-hundredth to one-eightieth of a grain and gradually increasing it. You can give Thomson's solution of phosphorus, one half-drachm of which contains about one-eightieth of a grain. You

can increase that dose, or combine the two drugs in some other way. I am particularly fond of giving the phosphide of zinc and strychnine in pill form, thus :

R Zinci phosphodi, gr. $\frac{1}{4}$;
Strychninæ, gr. $\frac{1}{80}$ (to $\frac{1}{40}$).
M. Ft. pil. no. i.

To this you can add aloes or rhubarb or colocynth, as the case may require. So much for the treatment, but it often has to be varied. A most important thing of all is to determine the cause of the neurasthenia, and then treat accordingly ; rest or diversion, as the case may be. Alcohol must be prohibited if it be the cause, and if sexual excesses be the cause, see to it that the exercise of this function is regulated.

CASE III.—The next case, though closely allied to the preceding two, deserves special analysis. He is twenty-one years of age, a native of New York. This young man was brought up in a protectory. He had been a bartender, and committed masturbation for a number of years. He complains of seminal emissions and acknowledges frequent sexual excesses. Abnormal sexual feelings are aroused by the presence of any woman, even his own sister. He has been in this condition for five years. He has been guilty not only of the grossest sexual excesses, but he is also a confirmed drunkard, and indulges altogether too freely in tobacco. The marked erethism in this case is the result of his depraved habits, even his own sister excites his lust ; that is an extent to which few cases are carried, yet I have seen cases here where the mere touch of a woman's dress will cause this, or even the handling of objects which a woman had handled. Some years ago we treated in this clinic a clerk in a dry-goods store, who felt sexual desire if he simply took a parcel out of a woman's hand ; but distinguish between these cases that are the result of depravity and the cases of which the excessive or altered sexual desire is the accompaniment of mental derangement. I claim that in this case the entire bearing of the man shows a certain amount of mental deterioration, and that this is due to his sexual and alcoholic excesses. It is manifested, if in no other way, by the light-hearted manner in which he speaks of his condition. The neurasthenia is engrafted upon a degenerated brain. In this case, as in many others, hereditary predisposition has been made a curse by a vicious mode of life ; our asylums and prisons are full of such subjects.

Now, what should we do for this man. Separate him from his surroundings ; keep him away from sexual excitement. Of course this is difficult in the city, where, in passing through the street and looking in the shop windows, he is constantly seeing something which

may excite his fancy. Let him have a certain amount of physical exercise, and make him do work under proper supervision. I should propose the same treatment as in the other cases, but drugs are of little avail in such an extreme case.

CASE IV.—With these cases of sexual and alcoholic neurasthenia, I ask you to contrast the following case, which will help to bring out the intermediate stage between the lighter forms of neurasthenia and the more serious forms of mental trouble. The patient is a married woman aged fifty-four, and has had ten children born alive, of whom eight are now living. Between the births of these children three miscarriages have occurred. She has been in good health until lately. Six years ago she had to consult doctors on account of a great loss of blood from a miscarriage, since which she has really never felt well, but nevertheless has been able to attend to her housework. She complains of bad feelings in her head, which she thinks commenced with a sudden fright, caused by the announcement of a daughter's engagement. The thought that her daughter would leave her seemed to unnerve her so that now the very sight of her children makes her unhappy, and she has no enjoyment whatever in her home. She has terrible pains in the chest and gets very much flushed at times, while her bowels have a feeling as if they were turned to ice; then she gets nervous tremors. These attacks do not come on when she is in the street; but, as a rule, while she is at home. There is at such times a throbbing and a great pain on the top of the head. She seems to sleep well in the first part of the night, but wakes up in the morning full of those unhappy thoughts; she feels as if she were tired of life and would like to die; she does not in any way blame herself, nor can she attribute this unhappiness to any wrong she may have done, as she knows her past life to have been a good one; she thinks all this punishment is undeserved, and is very anxious to get rid of the burden of life. She has consulted doctors and followed their advice in this matter, trying to get well in every way. At the climacteric, things passed off very nicely, so that no trouble could be attributed to her change in life. It is only for the last two months that she has suffered very much, whereas menstruation ceased five years ago.

This is a history of a series of complaints that we hear very frequently, especially in women of this age. We have here the ordinary symptoms of hypochondriacal neurasthenia; vague pains throughout the body, peculiar sensations in the bowels, and pains in the top of the head. Here you see that these symptoms occur in an elderly woman, brought about by worry from the care of a large family, and by

the disabilities from which she is suffering. But some of you will question whether it is possible to draw a sharp line between the neurasthenic condition and actual mental derangement; that is to say, shall we speak of this case as a special form of neurasthenia, or is the patient suffering from melancholia. Both of these conditions are common in women, though they occur in men also, particularly in the second half of life. Many persons would give off-hand the diagnosis that the woman has an actual melancholia. Now, I say she is suffering from hypochondriacal neurasthenia, and that she has a nervous depression dependent upon that condition. That is a very different thing from making the diagnosis of melancholia, which should not be made unless we have a very pronounced set of symptoms, prominent among which will be a lack of desire to do anything,—a slowness of mental and physical functions, but, above all, a very marked depression, which is much more than this woman has. Furthermore, a patient with true melancholia has the feeling that she deserves more or less the trouble from which she is suffering, hence you have heard me put the question to this woman whether she had done anything wrong to which she might attribute her troubles. In this patient the condition is not so marked that you could call it melancholia; she does not accuse herself of being responsible for her ills, nor is there so marked a depression. If you take into account what the symptoms are, you would find it the most natural thing in the world for her to be in a somewhat melancholy mood, and you must draw the line between a melancholy mood accompanying the neurasthenic condition and the actual condition of melancholia. When, as here, you have a melancholy condition following hypochondriacal neurasthenia, a much more favorable prognosis can be given than in true melancholia. On further interrogation you have heard the patient say, "I wish I might feel differently from what I do, so that I would be happier."

You see that in all she says there is a prominence of the *ego*; in all she says she is concerned with the sensations she has. She is unhappy on account of her own discomfort, and only secondarily as to the inconvenience she is to her family. Take a person with melancholia, and she scarcely ever thinks of her own person; she will suffer the tortures of the damned; will prick herself with pins and tear her hair, thinking that the punishment is what she deserves. This woman would do nothing to increase her pain; on the contrary, she would do anything to remove it. I must call your attention to a special set of symptoms not uncommon in these cases of hypochondriacal neurasthenia. I refer to imperative conceptions. They are symptoms which

often accompany more serious mental trouble. We include under this term ideas that arise in the mind so frequently as to be annoying, and always break in upon the ordinary association of ideas. The sight of a knife suggests that the patient might do some harm with it. We had a patient here three years ago,—a woman of about the same age as this one and suffering in this same way,—who felt that she would use the knife on her own child. We had to separate her from her children, but after that she had the same fear towards her husband, and so we had to separate the man and wife, for sometimes these patients will, though very rarely, act upon their conceptions. In other cases these imperative conceptions take a different form ; for instance, a gentleman from this city had a very common form of this. He could not bear to go near a window for fear of tumbling out. Before going into a room, he would send some one ahead to make sure that all the windows were bolted. That same gentleman also, before sitting down to the table, would feel the knife, fearing that it might be too sharp, and that he would do some harm with it. All these fears are due to the imperative idea that some harm will come, and, of course, the knife is an instrument with which these imperative conceptions are connected easily enough. This form of trouble occurs commonly in neurasthenia. You have heard of people who fear to look into a deep well, or to go near a precipice, dreading that they might be drawn down ; others will keep at a ludicrously safe distance from the edge of a roof, and others, again, will on ship-board have the fear of being drawn into the water. Such imperative conceptions are removed but a degree from the experiences of normal life. Many of you on leaving your house will go back again to see if you have closed the door.

Many persons have the same fear about lights that they have turned down. I have known persons to get up three, four, or five times, in order to be certain that the light was turned down. The story is told of a Boston gentleman who had the imperative conception that his trousers were unbuttoned, and would never go into society for fear his clothing was not properly adjusted ; he had to have an attendant with him to look him over before he would enter a parlor. The attendant would look him over and say, "Sir, you are all right." Thus reassured, he could enter into the presence of ladies. I treated some time ago a bright young man who was sorely troubled by this condition. In him the imperative conceptions took such a form that he was compelled to reason about all things, especially religious matters, and in the course of these religious discussions, which generally occurred with the priest, he had to use his words in a definite order, and, in order to do that,

would have to repeat sentences over and over again ; then always a doubt would arise in his mind that he had not stated the exact truth, and he would always end a statement by the words, " At least, I believe that that is so." He would try to cover the truth entirely. This peculiarity entered into all his dealings, and his eccentricities were explained by the control these imperative conceptions had gained over his mental self ; he felt that his mind was in a labyrinthine muddle from which he could scarcely extricate himself. So much for these imperative conceptions, which you will find often associated with hypochondriacal neurasthenic forms. But we must return to our patient. We can say that if we can improve the general condition, if we can increase the amount of blood, and if we can make her mind easy by encouraging her about the future, she will work out her own salvation. Wherever this condition exists, you can do much by change of surroundings. Even in these you will derive benefit from hydrotherapy and diversion. Luke-warm douches gradually lowered to cold douches will have a bracing effect. In addition to that, in the majority of cases, you will find that tonics, such as quinine, strychnine, arsenic, and, above all, iron, are of the greatest possible benefit. In the severer forms of melancholic depression in elderly persons, there is one drug that seems to have a wonderful influence over this condition, that is opium, or some drug that is closely allied to it. In these cases you give one-sixth to one-fourth of a grain three times a day together with some drug that will counteract its constipating effect. Of course there is a slight danger of forming the opium-habit, and we are very glad to have a drug closely allied to opium that does not lead so readily to a habit. That drug is codeia. In the patient before you this treatment has been followed by very good results. We have given her codeia in half-gramme doses three times daily, and have regulated her diet and mode of life. She is much better than she was a week ago, and in a few weeks, when you see her again, you will notice but few traces of her present hypochondriacal neurasthenia.

MYOTONIA AND ATHETOID SPASM.

CLINICAL LECTURE DELIVERED AT THE PHILADELPHIA HOSPITAL.

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LADIES AND GENTLEMEN,—This morning I will bring before you two cases of a type seldom seen, and one of them almost unique. They are both cases of spastic disease, presenting points of similarity, and yet in certain particulars strikingly different. In one we have spastic immobility, or tonic spasm of a certain type; in the other, mobile spasm, or atheto-choreoid movements. In both the abnormal phenomena begin, or are increased, by effort after rest, or by increased volition during action. One case dates back to childhood, and is possibly hereditary. In the other the disease has been acquired, coming on after apoplectiform attacks apparently due to heat-stroke. In the Nervous Wards of this hospital, from time to time, we have cases of almost all forms of spastic disease, from the old-fashioned general epileptic convulsion to an isolated spasm of face or finger or toe; choreas functional and organic; of childhood, of youth, of adult life, and even of old age; and cases of chorea miscalled after Huntington. Before the close of this course of lectures, I will probably show you almost every form of sclerosis of the nervous system giving rise to spastic symptoms,—symmetrical lateral sclerosis with bilateral spasm of the lower extremities, ataxic paraplegia, Friedreich's ataxia, amyotrophic lateral sclerosis, and disseminated sclerosis, with its curious mingling of phenomena, including some spasticity. Such cases are comparatively common here; but two cases, such as I have to-day the opportunity to study with you, are, even with us, of rare and curious interest.

Both of these patients have been carefully studied in the wards, with the assistance of my *interne*, Dr. Stella Taylor, and photographs of them in illustrative positions have been taken.

Let me briefly give you the history of the first patient, as we have determined it in the ward.

I am not sure that his statements can be relied upon entirely. His mind is either somewhat weakened or, what seems to me most probable, the conditions which his symptoms impose are such that the man appears at a disadvantage when he is under examination. He is often irritable, as you or I would perhaps be to a greater extent if suffering as he does. He sometimes gives conflicting accounts of himself, but perhaps not more so than might be expected from a man of his education, and with the cruel experience through which he has passed.

CASE I.—MYOTONIA AND INERTIA ON VOLUNTARY EFFORT.

B., forty years of age, gives a negative history, so far as nervous disease is concerned. I cannot make out, as would be interesting in connection with a theory of his case, that anybody in his family has suffered from a similar affection. His mother had "slow consumption," of which she died. His father died of pneumonia. He had the diseases of childhood, such as measles, whooping-cough, etc., and the only other acute disease of which any record can be obtained is that of typhoid fever, when he was thirty years old, and from which he was ill seven weeks. He did not, however, during all this time remain in bed, and he says that he suffered much at the time with pains in the limbs. It might be interesting to consider, in connection with this statement, whether his case was one of true typhoid fever, or if it was, whether he did not, during the disease or during convalescence, suffer from a form of multiple neuritis.

He can trace back some symptoms of the affection—for the study of which I bring him before you—nearly thirty years. He remembers that when a boy ten years old his father took him to a medical college to get advice about his hands, even then in some way afflicted with weakness or with clumsiness and difficulty in using them. He does not, however, recall distinctly what the conditions were. He believes that his feet also were slightly affected in childhood, and that he was somewhat stiff in his movements. He learned the trade of a weaver, but in a few years was obliged to give up weaving, chiefly because he had no grip.

He has never had a paralytic stroke, or a spasm with unconsciousness. About seven years ago, while standing one day in the street, his right leg suddenly gave way, and he fell backward to the ground. From that time he began to have curious attacks, in which in spite of himself he would suddenly, and sometimes violently, fall to the ground.

These attacks became more and more frequent, until he learned by carefully watching his movements measurably to control their occurrence. They might happen as often as once a day,—occasionally even several times a day; and sometimes, again, he might not have such a seizure for a week or more. As he expresses it, the only thing he knows is that at these times he would suddenly go down. For a long time the dropping seemed to be due to weakness of the right half of his body; but for several years he believed that both sides of his body had been so affected as to permit this precipitate falling. He bears upon his head, as can be seen, the evidence of the frequency and severity of these falls,—nearly a dozen scars. He is absolutely sure that on none of these occasions has he been unconscious, or even dizzy, which precludes the idea that the attacks are forms of either major or minor epilepsy. His consciousness is preserved, unless in consequence of the severity of the falls. The experience has often made him rather too conscious of himself and his sufferings. In his own language, inelegant but expressive, “he may have been knocked blind, but he always knew what was going on until he fell.” He has been taken up for dead on one or two occasions, after falling down stairs. Early in the history of these seizures he was able to get up without assistance, but now he cannot do this, even though he perfectly preserves his senses.

When he gets into any one of several positions he has the utmost difficulty in again becoming erect. When sitting on a chair, if he attempts to rise he will stiffen, and only by strong effort can he push and help himself to his feet. The photograph (Fig. 1) shows his position when he has half arisen from a chair. At this stage of the procedure he holds firmly to the back of the chair, with the other hand pressing upon his knee and thigh, gradually forcing himself upward. If sitting down, or even upon his knees, on the floor, it is impossible for him to rise and stand without assistance, and indeed without such assistance as will lift him absolutely to his feet and fix him there firmly before the support is withdrawn. If this support should be withdrawn a moment too soon he will tumble, and on occasions he has been hurt in this way.

When he walks his movements are stiff and his steps short; his gait is shuffling, his limbs keeping close together; his eyes are on the ground, as if in fear of falling. After proceeding a short distance he limbers up, and walks with more ease and alacrity, but if this exercise is continued for a considerable time, on tiring he becomes worse again, the stiffness of the limbs reasserting itself, and the danger of falling becoming imminent.

Whatever the effort attempted, the immobility and difficulty of action are started or increased. When his hands are closed and he attempts to open them a curious exhibition is witnessed. A spastic wave seems to flow from his shoulders to his finger ends or the reverse. The arms are strongly flexed at a slight angle, a greater flexure occurs at the elbows, and still more at the wrist; the thumbs are slowly extended; then the fingers thrust inward are gradually unwound,—the whole of this is done with an appearance of strenuous effort, the entire extremities being in a state of tremulous, spastic excitement. With such efforts he can open and shut his hands, but cannot grasp anything. Although apparently his fists are so firmly shut, he cannot hold a dynamometer with any grip. When his hands are closed he complains of a strained feeling, but says it is not a cramp.

The second photograph (Fig. 2) exhibits what happens when, after having opened his mouth, he makes an effort to close it. He has for years had this fixing of his mouth after it is opened. He may be unable to close it for a minute or more; he usually places his hand, as shown in the picture, alongside of his face, pressing firmly but slowly upon the lower jaw, until after a time a sound is heard, the jaw seems to unlock, and the mouth closes. He never bites his tongue, and when his mouth is open can protrude the tongue with difficulty, it usually turning slightly to the left and remaining in this position. When the mouth is opened the condyle slips over the articulating eminence, but the tendency to do this has resulted in all probability from the abnormal muscular conditions so long present.

In many ways the effects of volition and of exercise after rest have been investigated, but always with the result of causing spastic immobility, or, at least, inability to act efficiently.

His speech is peculiar, and can perhaps be best described as a mumble, as is illustrated to you by his answers to the questions I put to him. This peculiarity of speech appears to be due to the fact that he does not open his mouth wide enough; or it may be, as he himself explains it, because his tongue is held and carried to one side, so that he cannot use it freely.

He suffers much steady pain in the head, which he describes as neuralgic. He says it runs from the face backward, but does not extend down the neck to the arms. He also complains of pain in his back, from the lumbar region downward. This seems to spread around the abdomen, in which he has cramps or constrictions. He describes these sensations as sometimes like cords around him, or as though something compressed him tightly. The pains in his back and



FIG. 1.—Myotonia. The patient's efforts in rising from a chair.



FIG. 2.—Myotonia. Method of closing the mouth by assisting with the hand.

sides he describes as rheumatic pains, although he has never had rheumatism of the ordinary type.

Sensation to pain in his left leg, and particularly at times in the thigh, on the posterior aspect, and on the top of the foot, is increased. So far as can be made out, the sensation is normal on the inner side of the thigh, and diminished somewhat over and below the knee. In the right leg sensation to touch and pain is everywhere increased.

Knee-jerk, muscle-jerk, front-tap, and ankle-clonus are absent.

He complains of sleeping poorly. His appetite is fair, and, except as noted, his general health is good.

Let me, even at the risk of some repetition, summarize briefly, at the same time demonstrating to you, with the patient before us, the main points and features. The case dates back to childhood, and it is not at all improbable that an hereditary history is somewhere concealed. Often, particularly in this traditionless country, family history is difficult to obtain, and much of it, when got from sick or comparatively ignorant patients, is worthless. This man, however, does not know of other cases like his own, or of other forms of nervous disease in his family. His affection is undoubtedly spastic, and while spastic conditions are always more or less present, they are without doubt excited and aggravated by voluntary effort. Let me stop to illustrate this to you. I will have him walk around the arena. Notice his peculiar attitude and gait, very slightly bending forward, his eyes taking in the floor, somewhat like an ataxic. He moves with short, quick, and yet shuffling, close-limbed steps. He walks in a measured way, like one in fear and dread. This is his mental condition, in consequence of the severe falls he has had. I tell him to sit down. He does so in a stiff, awkward manner. I ask him to open his mouth, and now to shut it. Observe his expression and his efforts. In spite of his efforts he is unable to close his mouth until, as indicated in the photograph, he places his hand to the side of his jaw, and using a little lateral pressure, it goes shut slowly and with an unlocking sound. Asking him to rise from the chair, he does so with effort, climbing to the erect position slowly. As already stated, and as you can see, the photograph (Fig. 1) has caught him just as he has half reached an erect position. We assist him to his knees, fearing that he may fall. He is totally unable to rise until now, with the assistance of the resident physician, I lift him upon his feet, being careful to get his legs so placed that his centre of gravity shall be all right before letting go. Watch the striking experiment of having him close his hands firmly,

and then try to open them again. The more his efforts increase the more difficult does the work appear. His arms bend and twist, his fingers begin to open as, with every appearance of intense effort in face and limbs, he throws all the force he can command into the task. Finally, with a supreme effort, his fingers are unclapsed, and now they limber up rapidly.

As stated in his history, and as I demonstrate, the knee-jerk, muscle-jerk, front-tap, and ankle-clonus are not present. Ophthalmoscopic examination of his eyes by Dr. de Schweinitz has shown no lesion of the fundus. The pupils respond promptly to light.

This case more closely resembles that known as myotonia congenita, neuro-myotonia, congenital muscular spasm, or Thomsen's disease, than any described affection. The last name has been adopted from Dr. Thomsen, a physician of Schleswig-Holstein, who carefully described the affection from which he himself was a sufferer, and in whose family evidences of an analogous spastic disorder had been present in five generations. He studied it both in himself and in four sons. It is a rare affection, although apparently more common in Northern Europe than elsewhere, but this apparent preponderance of cases may be due to the interest excited by the disease having been first reported in that part of the world. Leyden, before Thomsen, and even Sir Charles Bell, many years ago, described this or a similar affection. The most pronounced symptoms of Thomsen's disease are certainly present in our patient. In detailing his history from the hospital records and in my demonstrations before you, I have given these so fully that it is scarcely worth while to repeat. The main phenomena are inertia, immobility, rigidity, or tonic spasm after rest, and initiated or increased by voluntary effort. Almost every muscle or muscular group in the body may sooner or later become involved in this disorder. After a time, at a given test, the conditions improve under exercise. This seems to be as it is often described by the patient, literally a limbering up of the parts. This improvement passes away, and the inertia or rigidity is again brought on by renewed efforts.

The muscles do not suffer, at least so far as nutrition and appearance are concerned. In fact, we have, as might be expected when the frequently-repeated forced exercise is considered, undue muscular development. Look at this man's trunk and arms. He has the appearance of an athlete, and his muscles to the touch are firm and hard. Yet his appearance is a parody upon his powers of performance. Muscular-appearing as he is, strong indeed as he may be in reality if his efforts could be controlled, the merest child can overcome him.

According to some of the best authorities the disease is really, in the extreme sense, a muscular one. It has been described as a congenital malformation of the muscular fibres.

To Jacoby and Erb we owe our knowledge of the microscopical anatomy of this disease, and to the former an interesting theoretical consideration of the manner in which the hyper-contractions or tetanoid phenomena occur.¹

Diseases which in some respects closely resemble the case before us and Thomsen's disease—whether this case is or is not an illustration of that affection—are muscular pseudo-hypertrophy, tetany, and some forms of sclerosis. We also probably have what might be termed an hysterical or pseudo-myotonia. Myotonia resembles muscular pseudo-hypertrophy in the increased bulk, the disability of the patient, and the usually hereditary character of both affections. Pseudo-hypertrophy is not a spastic affection, however; its manifestations are not dependent upon voluntary efforts, the gait differs from that of myotonia, and we have not in this affection the same appearance, generally only certain muscles or muscular groups being enlarged. Tetany is only like myotonia in the occurrence of tonic spasm. Tetany is usually an intermittent or remittent disease, while myotonia is a continuing affection; the former occurs most frequently in early life and is usually temporary; the latter may be congenital or acquired, but may occur at any age and then persist through the rest of life. Other points of difference are that tetany is not infrequently epidemic, that the mechanical and electrical irritability are increased, and that it occurs under certain peculiar causes, as diarrhoea, fatigue, exposure, and the puerperal state. Symmetrical lateral sclerosis, and perhaps mixed sclerosis, may sometimes bear a superficial resemblance to myotonia, but it is only superficial, and a knowledge of the symptomatology of the scleroses would prevent mistake on careful examination.

We sometimes see an affection closely resembling Thomsen's disease which is probably hysteroid, and under time or treatment passes away. Several such cases have come into my hands, and one such has been described by me in "The American System of Practical Medicine" (vol. v. p. 241). The patient described his condition as one of spasmodic paralysis of all the muscles of the body. If sitting down, he could not at once get up and walk or run, but would have to use a strong effort of his will, stretching his limbs several times before getting to his feet. Movements once started could be continued with-

¹ Journal of Nervous and Mental Diseases, vol. xiv., No. 3, March, 1887.

out difficulty. When his hands were closed he would be unable at times to open them except by a very strong effort of his will. If one was opened and the other shut, he could manipulate the latter with the former. He sometimes complained as if a steam-engine was pumping in his back and shaking his whole body. He would be sometimes in a condition of stupor or pseudo-stupor, when he had a feeling as if he were under the influence of some poison. He compared the feeling in his back to that of having a nerve stretched like a piece of India-rubber. The excitement of mind would then cause the nerve to contract and throb. Examinations of the muscles of the legs and arms did not reveal, as in true spastic paralysis, conditions of rigidity. The limbs would sometimes be stiff when first handled, volition unconsciously acting to keep them in fixed positions, but they would soon relax. The knee-jerk, although well retained, was not markedly exaggerated as in spastic paralysis, nor was ankle-clonus present. The patient did not get progressively worse, but his condition vacillated and he eventually recovered, his cure being apparently due to the persistent use of the actual cautery over the spine.

Some cases of gross brain-disease bear a close resemblance to myotonia or Thomsen's disease. A case of this kind, which was at one time under my care for a brief period in this hospital, has been recorded by several physicians of St. Louis. Dr. A. B. Shaw reported it as a case of atypical, non-congenital myotonia, and Dr. C. Hughes as neuro-myotonia, both in the *Alienist and Neurologist* for January, 1890. Drs. L. Bremer and N. G. Carson, however, have, in an elaborate and valuable paper, put the same case on record as one of brain tumor (angioma cavernosum), causing spastic paralysis and attacks of tonic spasms. An operation was successfully performed by Dr. Carson. The paper of Drs. Bremer and Carson was published in the *American Journal of the Medical Sciences* for September, 1890.

The prognosis in such a case is bad, although the patient may remain without much change for many years. Galvanism to the brain, cord, nerves, or muscles has been recommended and has been tried with some temporary benefit. Erb has advised the hypodermic use of curare. Massage and Swedish movements may be tried; and Dr. Thomsen believed that the most good resulted in the family affection of which he was a victim, from following a life of active muscular exertion. With reference to treatment, the possibility of a case being hysterical or neurasthenic, and therefore curable, should not be overlooked.

In concluding the discussion of this case, I will direct your atten-

tion especially to the conditions of electrical and mechanical excitability present.

Let me first, however, rapidly discuss some of the peculiarities of electrical reaction. What is usually spoken of as the reaction of degeneration is now well known to the average physician and medical student. Patients suffering from peripheral nerve-disease or from affections in which the nerve-roots or nuclei within the spinal or cranial cavity are involved, present marked changes in excitability or contractility, when neuro-muscular examinations are made with the faradic or galvanic currents. Coincident with more or less wasting faradic contractility may be entirely abolished, while to galvanism certain peculiar changes which are spoken of technically as modal or serial may be present. This modal change is one which shows itself to the eye of the investigator,—a peculiarly slow, worm-like quivering of the degenerated muscle, even under the influence of a very weak current. Once seen and understood it cannot well be forgotten, although a mere description of it will not convey a clear idea of what is meant.

Serial changes are qualitative also, and the term is used because when successively the anode or cathode is applied on opening or closing the circuit we get a difference in degree, and to some extent in character, of the response. When nerve and muscle are normal this formula takes a certain order, the cathodal closure leading, the anodal closure coming second, and then anodal opening and cathodal opening. This order is changed in degeneration reaction.

This, rapidly summarized, is the series of electrical conditions to be found in cases which give the true degeneration reaction. In certain spastic cases, however, of which probably this patient is a type, an electrical reaction *sui generis* is said by Erb and others to be present. This has been termed the myotonic reaction. Erb was the first to study it carefully, and he has given a description not only of its characteristics, but also of the best methods of studying it. The method is not particularly different from that which is employed ordinarily for electro-diagnostic purposes. A large electrode is placed upon the sternum; or, although not so suitable a place, upon the back of the neck; and another electrode of medium size in the palm of the hand. Using now a galvanic current of sixteen to eighteen cells, and allowing the current to flow, a tonic spastic condition of the muscles of the arm occurs. In a little while, particularly after changing the poles with the commutator, curious wave-like contractions take place in a serial, rhythmical order. These undulations move upward or down-

ward, according to the position of the anode and cathode,—downward when the anode is in the hand, upward when the cathode is in the same position. They move inward from the negative to the positive. Erb has compared the single waves to those produced by a stone falling in water. He considers that the best places for the application are the flexors of the forearm, the palm of the hand, or the volar surfaces of the wrist-joint and nape of the neck. The amount of current requisite for the production of the phenomena varies from six to twenty milliampères.¹

Erb lays such stress upon electrical examinations in cases of this kind that he makes the assertion that, in order to diagnosticate Thomsen's disease, a few closures of the galvanic current and a few blows with a percussion-hammer are all that may be required. This statement may be correct enough for absolutely typical cases, or for cases of the kind particularly examined by himself; but certain aberrant forms of this extraordinary spastic affection do not seem to present, to the full extent at least, and a few not at all, the myotonic reactions described by Erb.

A few points more, or rather in the way of clearing up this subject, and we will then proceed directly to the examination of the patient. This myotonic reaction may be found in normal or nearly normal muscles, thus differing from degeneration reaction, which occurs only in paretic and atrophied muscles. The reaction of degeneration is localized in correspondence with palsy and ataxia. The myotonic reaction may be made out in almost all the muscles of the body under the control of the will.

Several times I have carefully examined this patient, both with faradic and galvanic currents, sometimes following the exact method recommended by Erb, at other times varying the methods. Whether I used galvanism or faradism, one electrode of large size was usually placed either on the sternum or nape of the neck, and the other sometimes in the hand and sometimes on various nerve- and muscle-points of the upper extremities. My results corresponded closely with those found by Jacoby in the electrical investigations in his case. The tests were made over the median, ulnar, and radial nerves, and over the deltoid, biceps, supinator, forearm extensors and flexors, interossei, and other muscles. Both slowly- and rapidly-interrupted faradic currents were employed. Immediate comparisons were made with another patient whose arms were normal.

¹ Quoted by Jacoby.

With the slowly-interrupted faradic current, the only difference that could be made out clearly was that stronger currents were required to produce contractions, and these were more prolonged than in the healthy muscles. With rapidly-interrupted currents the faradic excitability was marked, and when strong currents were used the contractions persisted for a few seconds after the removal of the electrode. I could not see any difference between nerve and muscle applications.

The galvanic tests both upon nerve and muscle were repeated. The rhythmical wave-like contractions described by Erb were not produced,—that is, if I understand his description. No distinct undulatory movement could be observed passing either up or down the arm, although the contractions took place in a series or succession, usually from the hand towards the shoulder. With the testing electrode in the palm of the hand or over the muscles, when a strong current was used, a spastic contraction occurred, the hands becoming partly flexed and bunched, and strong contractions then taking place in the forearm and arm. With the cathode below, at closure, the contractions undoubtedly occurred first in the fingers and hand and then spread to the forearm and arm. When the current was broken they persisted for a long time, sometimes as much as a minute.

The nerves and muscles were tested for mechanical excitability by pinching, pressing, and striking with the fingers and hand, and also by using a knee-jerk percussion-hammer. In the deltoids, but only here, a smart blow with the percussion-hammer caused some grooving or furrowing of the muscle. Tapping the extensor muscles of the forearm and the interossei muscles of the hand caused contractions which persisted for some time. In brief, the muscles showed some mechanical excitability, but not to a striking degree.

CASE II.—ATHETOID SPASM AND MYOTONIA ON VOLUNTARY EFFORT.

This patient, J. S., fifty years old, is married, and has seven living children, all healthy. No family history of nervous disease can be obtained. Eight years before admission to the hospital, while working at a machine works, but out of doors as a packer, he had a sunstroke, or a sudden attack supposed to be that, which was followed by a fit, or a seizure of some description. He was taken to a hospital, recovered from this attack in a few days, and went to work again. In about a week, however, he had a similar attack, and after this others of a like character every week or two for several months. So far as he can recall, however, since a year after the first seizure he had had

no other like those from which he had suffered at first. When taken to the hospital on the first occasion he was in an unconscious state. After the other attacks, which he believes were lighter, he was taken to his home. He found after the first or second that his left leg was weaker than the right, that it was partially paralyzed in fact, as he could not walk without dragging it. He remained at home, walking with the aid of a stick and not working, until he was brought to the hospital, nearly a year ago.

It is difficult to trace the various progressive steps of his history, owing to his weak mental condition, and to the uncertainty of his family with reference to the manner in which his disorder developed and progressed. So far as can be learned, he began to have spastic and athetoid movements in the limbs of the left side—probably first in the upper extremity—soon after the series of seizures. Not much more than has just been stated can be learned about his previous history.

Inspecting this patient sitting down, it will be noticed that he sits with his head erect, slightly thrown back and stiff, appearing like a soldier in the old-fashioned stock,—his eyes directed somewhat fixedly to the front. The posterior muscles of the neck, and to a certain extent all of the muscles of this region, seem to be in a more or less spastic state, to which the forced and somewhat rigid position of his head is probably due. Sometimes his head becomes twisted a little to the left, and backward. His limbs, trunk, and body generally, even when quiet and uninfluenced by voluntary efforts, have more or less spasticity or rigidity. The lines of the forehead are more decided upon the left than upon the right side, as are also the glossolabial folds of the left side of the face. His mouth is at all times somewhat distorted. The left half of the upper lip has the appearance of being drawn somewhat under, giving the curve of the lip on this side a twisted appearance. His general muscular development is good, perhaps excessive; and the muscles seem to be larger and harder on the left side than on the right.

The most striking features of this case are brought out when the patient attempts any voluntary movement, and in proportion to the extent and importance of the willed action will be the choreoid and spastic phenomena. These can be demonstrated in a variety of ways,—in fact, in spite of himself he is constantly exhibiting them,—certainly so whenever he attempts to do anything, however trifling or however important. They can be well shown, for example, by having him open his mouth, speak, lift one hand, seize his cane, attempt to rise or walk, or even by asking him to direct his attention to what you say. In



FIG. 3.—Athetoid Spasm and Myotonia. Appearance of patient on opening the mouth.

the photograph (Fig. 3) you see the effect produced on opening his mouth. At once the muscles on the left side of the face are drawn upward somewhat forcibly, involuntary spasm of the facial muscles occurring. Some snapping of the eyelids also occurs. The muscles of the neck are affected with spasm, twisting the head somewhat to one side and backward. The mouth being opened, his tongue is found to be drawn backward. He has never bitten his tongue, although at times his jaws shut down violently. At the same time that these appearances are presented by the face, the left upper extremity is thrown into marked athetosis or athetoid spasm. The fingers are twisted and thrown into the position shown in the photograph,—a good example of a form of athetosis of this extremity as sometimes pictured in the books. The left leg is coincidentally thrown into more or less spasmodic action. The right half of his body, moreover, does not escape this combination of mobile and immobile spasm which so strikingly affects the left. As will be observed, a slight athetoid movement takes place in the right hand, with some extension of the spasm to the entire upper extremity. This athetosis of the left upper extremity and the spasm of the muscles of the face, particularly on the left side, are always the phenomena which are most decided, or at least most readily observed. Whatever may be attempted, this unfortunate left hand is thrown into involuntary spasm, the result being painful as well as awkward and grotesque. The movements of his fingers and thumb are so far beyond his control that these parts have been so often forcibly pressed and rubbed together that in various places even the true skin is rubbed off, the fingers presenting a bruised and scarred appearance. It is necessary for his comfort to have his fingers protected by bandages or by padding of lint or cotton, or some other material. It is difficult to describe the exact movements which take place, but they are similar in character to those which have been more than once described in the accounts of cases of athetosis. Sometimes all the fingers are separated ; or the index and ring fingers are sometimes extended to the same plane as the metacarpus ; or sometimes the fingers bend into the hand, and the thumb is drawn over the palm beneath the fingers.

Even efforts at opening and closing the eyes are attended by spastic movements, not as marked, however, as in the case of the stronger movement of opening the mouth, but they are still very striking.

If he attempts a series of movements with his left upper extremity,—which for his own comfort and protection he will not do, if he can help it,—the entire extremity is thrown into a succession of wild contortions, which, however, show some uniformity in method of repe-

tition. Usually the thumb is pressed into the palm of the hand, the other fingers being brought together with it, but not all at once; sometimes the thumb closes over all the fingers. These movements, however, appear at times to be reversed. While some order may be present in the method of this inco-ordinate spasm, it is not always easy to make this out.

The athetoid movements of the left hand and of the other parts of the body are caused not only by voluntary effort, but also by manipulation. It would appear that in spite of himself his will, as might be expected, is thrown into action when his limbs or any portion of his body are handled by another. Moving his trunk in different directions causes typical spasmodic actions to take place. The inco-ordinate athetoid spasms, and the tonic spasm, similar in the extremities of the right side, but far less marked than on the left, are not always elicited by the willed movements occurring on the other side of the body, but direct efforts to use the right arm or the right leg will cause them, at the same time calling out in a decided manner the movements on the other side.

Assisted to his feet, he can maintain a standing position, not so well with but rather without an effort. In order to do this it is necessary to get his feet a certain distance apart,—say about eighteen inches,—and then he seems to maintain himself there simply mechanically, almost like an inert mass. His limbs, when examined in this position, are as rigid as bars of iron, the left upper arm is drawn close to his side, the forearm abducted and extended, the fingers passing through a series of athetoid movements; the right arm is pendent, with the hand extended and the fingers slightly athetoid; the head is drawn slightly to the left. He is, in a word, a man with a large portion of his body rigidly fixed in spasm and his upper extremities at the same time in a state of mobile spasm. After remaining a short time in an erect position, in spite of every effort to resist,—the efforts indeed retarding what they are intended to accomplish,—the left arm will be drawn more closely to his side, the athetoid movements will augment, and the right arm will be drawn over spastically to the abdomen. The trunk is rotated to the left, but not markedly.

With effort and great care he can walk, using a cane, which he is able to hold fairly well in his right hand. With his left hand he cannot grasp it, or anything else, the extensor muscles springing his hand open and the series of inco-ordinate movements wildly following. As he walks stiffly, he balances himself, holding his stout cane in one hand, a short distance from his body. The left arm is thrown out from

his body, spastic to the elbow and athetoid below. His legs are moved rigidly, the left in advance of the right; the feet are lifted high from the ground, coming down with a thump, this thumping being especially marked in the right foot. The whole effort at progression is laborious, and is accomplished simply in spite of the continuous spasms, mobile and immobile. The feet are necessarily always kept well apart, the toes turning outward, and as a rule the foot coming down flat, sometimes striking upon the heel. To go up or down a stairway alone is utterly impossible, and even when assisted by two persons, unless great care is taken, he is in extreme danger of injury, owing to the excessive movements which are set up. He sits down with a sudden movement, requiring care for fear he may lose his balance and upset the chair. Gradually, but surely, he is losing the power of walking alone. Sometimes a sudden tangling of the legs, particularly the left one crossing or running against the right, will occur. His walk might perhaps be described as an inco-ordinate, irregular, spastic gait, with a tendency to high stepping and cross progression.

On opening his mouth widely he has considerable pain, and his tongue, as already described, is drawn backward, and this to the full limit that the cavity will allow, as if he was about to swallow this member. The position is possibly due to the spastic action of certain of the lingual muscles. He speaks loudly, quickly, almost explosively, with rising inflection, and often as if in a hurry or impatient to get through with what he has to say. The movements of the mouth and tongue are abrupt and jerky in character, and he has difficulty in the enunciation of some words and syllables.

He cannot read,—that is, he is not able to read because of the manner in which he is affected by his disease. His sight, as near as can be made out, is perfect, but he says he does not read because it hurts him to try to do so. The effort to turn a page, or even to fix his attention upon the reading, gives him pain and throws him into spasms, more or less marked, and of the kind described. His eyes have been carefully examined by Dr. de Schweinitz, ophthalmologist of the hospital, who reports no disease of the fundus oculi, except, perhaps, slightly-gray disks. His hearing is defective in both ears, but better in the right ear. He can understand what is said to him, if he is spoken to sharply and loudly.

Efforts have been made to test him carefully for sensation, but with results which are contradictory and confusing, owing to the spasm which is induced by the examination, and also perhaps to the general mental condition of the man. Going over him a second and third

time, somewhat different results may be obtained. In general, it was determined that sensation was markedly diminished in the left leg and the outer side of the right thigh, also, apparently, in both feet. A needle could be firmly thrust into the skin in these regions without any response, although sometimes some reflex muscular reaction was produced. On the inner aspect of the right thigh and leg, less so on the left, sensation to pain seemed to be acute. In testing for sensation he often referred his pain to his toes and jaws, crying out, "Oh, my toes! oh, my jaws!" accompanying the expression with grinding of his teeth. Over nearly the whole of the left arm and left side of the chest sensation appeared to be lost, deep thrusting of needles giving no result. In the left hand, in one or two places, he seemed to feel; also, at one or two points on the left arm. Sensation in the right upper extremity was almost lost over the outer posterior aspect of the arm. The dorsum of the hand and fingers, particularly towards the radial side of the arm, was sensitive. On the right side of the chest sensation was acute, repeated prompt responses being obtained from one prick. These results are not absolutely to be relied upon, owing to the answers obtained at different tests. Sometimes he would cry out when he had not been touched. Some of the confusion in obtaining proper responses may have been due to the fact that efforts to fix his attention upon the examination caused the initiation or increase of his painful spastic conditions.

Knee-jerk is increased in both legs; muscle-jerk, front-tap, and ankle-clonus are also present. In testing for knee-jerk and muscle-jerk the leg becomes spastic, the entire lower limb showing a decided tendency to become rigid and bar-like. Two or three taps with the percussion-hammer will cause continuous spasm in the leg, some trismus, and an increase of the athetoid movements described. Toe-jerk is absent. He has no headache, nor any pain except that which is associated with the phenomena noted, and which have been abundantly described as dependent upon involuntary effort. He eats pretty well, although it is impossible for him to feed himself owing to the spasms which ensue from the effort to do so.

The man is continually in a state of great general nervousness, as indeed might be expected in a person who cannot will, or even think with any energy, without being thrown into spasm, thus causing himself both direct and indirect suffering. This nervousness under sympathy and careful coaxing will become much better, and he can sometimes give the details of his history, which at first it seems hopeless to obtain. Now and then, even when sitting quiet, a snapping sound

of the jaws occurs. If kept waiting, or if made impatient by the process of examination or expectation, he is thrown sometimes into a state of great excitement.

On one occasion, when others with himself were being examined, he had a spasmodic seizure different from any which I had observed. It was like an epileptiform attack. The mouth and face were twitched with some violence to the right, a series of clonic facial spasms occurring. Both eyelids snapped and twitched violently. The right hand was thrown into a state of active athetoid or choreoid movement. The left hand, the one usually so severely attacked, was comparatively quiet. He was in a confused, semi-conscious condition. The attack appeared to be a species of Jacksonian epilepsy, with marked perversion of consciousness, and so far as the manifestations gave evidence was the result of an irritative lesion of the left half of the cerebrum. Reasoning from this attack, in connection with his continuous condition and the history of his past, it would seem likely that certain lesions are developing in the left half of the brain, similar to those which at earlier periods have appeared on the other side.

This case, like the preceding one, is of great interest. Few, if any, such cases have been described, although I doubt not that they have been seen. It is not that the special phenomena exhibited by this patient are not present sometimes in other cases, and in some which have been frequently described, but the peculiar syndrome presented by this man is not often met with even by the neurologist of wide experience. In some respect the case is analogous to the one I have just described as myotonia,—a form of Thomsen's disease; but it differs greatly in some particulars. In the first case the conditions present are chiefly tonic spasticity, with perhaps some real loss of power or paralysis of will coming on after volition. In this patient the spastic phenomena are an admixture of immobile or tonic spasm, with mobile, athetoid, or choreoid spasm, the latter predominating.

No matter what I ask this man to do, no matter what he attempts, and, apparently, no matter what he thinks about doing, he is at once thrown into a condition similar to this. Effort in his case produces both mobile and immobile spasm.

In this case the affection was acquired, apparently after heat-stroke. It would seem that he has had a series of apoplectiform attacks, or that the primary lesion of the right side of his brain has diffused, and that later a similar pathological state has developed upon the left side.

It is not a typical case of athetosis of the form first described

by the elder Hammond. Athetosis—a word which comes from the Greek, and means without fixed position—is an affection in which the patient is unable to maintain the fingers or toes, or these with other portions of the limbs, in a fixed position. It is characterized by continual, or almost continual, movement of the parts affected, and this movement is irregular and grotesque. The fingers and hand can be kept neither open nor shut.

Certainly, however, we have here athetoid phenomena, and we must look for an explanation of it to the same or similar lesions to those which produce athetosis. Autopsies have shown certain lesions as most commonly present in athetosis. These are sometimes porencephale, sometimes tumors, cysts, or other lesions in or near the thalamus, or in the motor zones or tracts. Mobile spasms, whatever their character, may depend upon lesions of the corpus striatum, the thalamus, the cortex cerebri, or any part of the motor tract. Of the cases collected by Seguin and Hammoud in different papers, the most constant lesion was in the neighborhood of the thalamus. In this case we have reasons beside the presence of athetoid phenomena for supposing that the lesion may be thalamic or situated in the region of this ganglion. To a certain extent the patient is hemiplegic, and while it is difficult to determine as to sensation, it will be remembered that he has more or less anæsthesia over the left half of his body and other changes in sensation. He has at times not only these demonstrable and developable athetoid and tonic spastic conditions, but also epileptoid attacks. He has had, as will be remembered, the history of a series of such seizures in the progress of his case. His symptoms having first developed upon the left side of the body, to a certain extent similar phenomena have now shown themselves on the right, showing that the lesions are probably duplicating in the two halves of the brain. Little can be expected from treatment, except to protect from injury and relieve pain. The lesions are too deeply situated or too diffused to permit of trephining for their removal with any hope of success.

ALCOHOLIC PARALYSIS.

CLINICAL LECTURE DELIVERED AT KING'S COLLEGE HOSPITAL.

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GENTLEMEN,—The subject of my lecture to-day—namely, alcoholic paralysis—is well exemplified by the case of Elizabeth Ann B., who recently died in the Todd Ward.

The patient, aged thirty-five, was admitted under my care on the 6th of November last. Her past history is unimportant, except in so far that she has been addicted to alcoholism. About five months before admission she began to complain of pain in both feet and in the right hand. The pain was accompanied by jerkings of this hand and of both feet. On the day before these symptoms commenced she had been exposed to cold and wet. She then began to experience weakness in the feet and legs, which gradually increased, so that two months before admission she became unable to walk, and took to her bed, which she has kept ever since.

On admission she was complaining of pains in the hands and feet, more particularly on the right side. She was very feeble, and unable to stand or even to sit up in bed. She lay in bed on her right side with her knees flexed and rigid. She was unable to extend her legs of her own accord, nor could they be extended passively, any attempt to do so giving rise to great suffering. She was unable to dorsi-flex either foot. The muscles of the anterior tibial group were wasted on both sides. Faradic stimulation, direct or indirect, caused no reaction of these muscles on the right side. On the left side a slight reaction was obtained in the extensor longus digitorum and extensor hallucis, but not in the other muscles, or, very doubtfully, in the tibialis anticus. The patellar-tendon reactions were absent on both sides, and attempts to elicit them evidently caused great pain. The plantar reflexes were

well marked, but the patient complained much when the proper tests were applied. The patient also complained much when the calves of the legs were firmly grasped, or pressure was made in the course of the trunks of the nerves. There was, however, no loss of sensation, for even a slight touch was capable of being felt and fairly accurately localized. The hands were tremulous, but there was neither paralysis nor wasting, nor loss of sensation in the hands or forearms.

Rhonchi and râles were audible all over the chest at the time of admission, and at a later date there were indications of œdema at both bases. The sputum was muco-purulent, but was found, on microscopical examination, to be entirely free from bacilli. The urine was slightly smoky and albuminous, and had in general to be drawn off with the catheter. It, together with the evacuations, was frequently passed unconsciously, or during the state of apathy which continued more or less throughout. The patient was sleepless and often noisy at night. The mental condition was one of apathy or dulness, varied by the noisiness at night already alluded to. The patient, who was very deaf, understood and answered questions, but was subject to strange fancies and delusions as to her whereabouts or surroundings. She also believed that she had a baby in bed with her.

The course of the case was one of progressive weakness, in spite of all attempts to combat the various symptoms. Slight pyrexia occurred at the beginning of December, and on the day before her death the temperature rose to 102° F. She died on December 8.

Autopsy.—There was a large quantity of subarachnoid fluid over the whole convexity of the brain, and many of the blood-vessels exhibited peculiar whitish streaks along their margins. The margins of the Sylvian fissure on both sides and of the inferior longitudinal fissure were somewhat adherent. The brain itself exhibited no abnormality, and was free from signs of hyperæmia.

The lungs were congested and œdematous, the base of the right being in a state of red hepatization. There were no tubercles. The tricuspid and mitral valves were both abnormally small, and there was some vegetation on the latter. The liver was large and fatty.

The other organs exhibited no noteworthy abnormality. Portions of the musculo-spiral and external popliteal nerves, as well as the lumbar enlargement of the spinal cord, were removed and placed in Müller's fluid for subsequent microscopical examination.

Similar to the above case is that of Alice P., who recently died under my care in the National Hospital for the Paralyzed and Epileptic. The patient, aged thirty-nine, the wife of a publican, was

admitted on the 4th of December, 1889, and died on the 1st of May, 1890. For nine years before admission she was in the habit of taking a good many "drops of gin" several times a day, though her husband says he never saw her intoxicated. Minute inquiries, however, elicited the fact that she was frequently in the habit of drinking as much as a pint of gin in the course of twenty-four hours.

About four months before admission she began to exhibit considerable loss of memory, especially for recent events, and two months before admission she became unable to walk, and exhibited great weakness in her arms and legs. These have gradually become contracted and stiff, as at present. Her memory has become greatly impaired. She becomes very confused; has never had any delusions.

On admission the patient had a dull, heavy, expressionless face; the cheeks were flushed, and the lips dry and cracked. She was unable to stand or walk, and also complained of great discomfort and fatigue when she was asked to sit up in bed for the purpose of examination. She appeared not to suffer from any spontaneous pains or hyperæsthesia. There was no tenderness on percussion of the spine, but pressure on the muscles on each side of the vertebral column caused evident discomfort. Both forearms were considerably wasted, more particularly on the extensor surface. The movements of the shoulders and elbows were retained, but those of the wrists very feebly. The thumb and fingers, with the exception of the index-finger of the right hand, were rigidly flexed at all joints. The index-finger was extended at its metacarpo-phalangeal joint, and flexed at the distal phalanges. A similar condition existed in the left hand. Slight further flexion was possible in the fingers of both hands, but they could not be extended voluntarily, and when extended forcibly the patient complained of great pain. The skin over the flexed joints was shiny and reddened. There was no anæsthesia or hyperæsthesia in the arms or hands, but there was great pain on pressure over the muscles of the forearms, and also over the median and ulnar nerves. All the muscles of the arms reacted to faradization except the extensors of the fingers and thumb. The patient lay in bed with both legs flexed at the knees and hips. She was unable to extend the knees voluntarily, and forcible extension gave rise to great suffering. There was no power of dorsal flexion of the feet, or extension of the toes. The muscles of the calves were very flabby and tender to pressure. The patient complained of numbness on the soles of the feet. Sensation above the knees for touch and temperature was good, but somewhat impaired on the legs and feet. Both feet perspired copiously. The extensors of the toes and peronei

gave no reaction to faradization; the *tibialis anticus* very feebly, as well as the *quadriceps extensor cruris* on either side. These muscles exhibited the reaction of degeneration to galvanism. Both knee-jerks were absent, as well as the superficial reflexes.

There was no affection of the bladder or bowel, or indication of disease in the thoracic or abdominal viscera. In addition to her general mental apathy, the patient was subject to delusions that her hands and feet were to be cut off, and she occasionally gave way to hysterical bursts of crying. Attempts were made to extend the limbs under chloroform, and to maintain them in this position, but this gave rise to such pain, and tendency to the formation of sores, that it had to be speedily abandoned. The course of the case was one of increasing weakness, sleeplessness, and restlessness, and death occurred after an attack of acute delirium.

Autopsy.—Nothing of any importance was found in the cranial, thoracic, or abdominal cavities. The spinal cord exhibited nothing abnormal, and microscopical sections, after hardening, made by Dr. W. A. Turner, exhibited a perfectly normal appearance. Sections of the anterior tibial nerves showed almost total disappearance of the proper nerve-structure, and conversion into strands of wavy fibrous tissue. The sheaths of the nerves were not thickened, nor the lymph-spaces dilated. The appearances of the musculo-spiral nerves were similar, but in these some traces of the myeline sheath were still visible.

In contrast with these two cases, which terminated fatally, take the particulars of the following case, which some of you had an opportunity of observing last spring. Catherine H., aged thirty, unmarried, was admitted into the Todd Ward under my care on March 27, 1890. Before the illness for which she was admitted she had enjoyed fairly good health, and denied having been addicted to alcohol. Her occupation was that of a barmaid, and inquiries elicited that she had taken large quantities of alcohol. Six months before her admission she was taken ill and laid up for six weeks, and was again taken ill about three weeks before admission, becoming somewhat delirious and rambling in her talk.

On admission she was found to be very emaciated and weak, and unable to stand or walk without assistance. There was considerable wasting of the anterior tibial group of muscles on both sides, especially on the right. Dorsal flexion of the feet was not entirely abolished, but was very feeble, especially on the right side. All these muscles reacted to faradic stimulation, but in a slight degree. There was great tenderness on pressure of the muscles of the calves, and to

some extent also of the muscles of the forearms, which, however, otherwise exhibited nothing abnormal. Tactile sensibility was practically unimpaired. The knee-jerks were absent, but the plantar reflexes were very active. The patient was subject to many hallucinations. She imagined that she had a baby in bed with her, that the sister of the ward was her own sister, and that the house physician and clerks were her brothers. She was occasionally noisy, especially at night, and frequently passed her motions in bed.

Under treatment she steadily improved. The muscles became less sensitive to pressure, she gained strength in her legs, and gradually lost her delusions, until at the end of July she was able to walk the whole length of the ward without assistance. She was discharged at the end of August practically well, but the knee-jerks were still absent.

I may mention also the chief points in the history of a fourth case, under my care last year at the National Hospital for the Paralyzed and Epileptic. Catherine L., married, aged thirty-nine, was admitted under my care at the end of December, 1888. It was ascertained that she had for a long time given way to excessive alcoholic indulgence in the form chiefly of brandy. About six weeks before admission she went for a walk one very cold day, and suddenly felt weakness in her legs, so that she had to hold on to the railings. She was, however, able to walk home. On reaching home she experienced great numbness in her feet, followed by burning pain. This has continued, more or less, ever since. The burning sensation comes on chiefly at night, but the feet feel very cold during the day. Three weeks ago the hands began to feel in the same way as the feet. The fingers felt swollen and clumsy and wet and clammy, and they were subject occasionally to throbbing, burning pain.

On admission she was complaining of loss of power in the hands and feet, and of pains in the legs, especially during the night. The movements of the shoulder and elbow-joints of both arms were carried out with considerable energy, but when the arms were extended in front there was well-marked drop-wrist on both sides, and the fingers were in a condition of semiflexion. There was considerable wasting, more particularly of the extensor surface of both forearms, as well as in the intrinsic muscles of the hands. The muscles were not tender to pressure. All the muscles of the forearms reacted to faradization, but less vigorously than normal. There was slight impairment of sensation to tactile and painful stimuli in the hands, but the thermal sensation was fairly acute. The muscular sense, or sense of position, was

somewhat impaired. The movements of the thighs and legs were fairly well carried out, but dorsal flexion of the feet was weak, especially on the right. The knee-jerks were absent, as well as the cutaneous reflexes. There was some impairment of sensibility to touch, pain, and thermal stimuli on the legs and feet. The patient complained of severe shooting, burning pains below the knees, especially at night, and there was considerable tenderness to pressure on both calves. The muscles of the legs were very irritable to direct percussion. All reacted to strong faradization, except the peroneus longus on both sides. In the peronei there was well-marked reaction of degeneration to galvanism. There was an entire absence of cerebral symptoms.

Under treatment the patient steadily improved, and was discharged cured in May, 1889. The knee-jerks, however, had not returned.

In all these cases the evidence of long-continued alcoholism was well established, but it is often very difficult to get at the truth in this matter, more particularly among private patients. The habit is frequently unknown to the patients' relatives or friends, owing to the surreptitious manner in which they obtain their alcoholic supplies; and the patients themselves, with that moral obliquity which characterizes the alcoholic as well as the opium *habitué*, will strenuously deny their failing in the face of the most convincing evidence. The abuse of alcohol, in addition to its well-known injurious effects upon the organs of assimilation and excretion, gives rise to a form of peripheral neuritis affecting the motor and sensory nerves, which results either in ataxic or paralytic disorders, of the latter of which the cases I have described are examples.

The ataxic form is perhaps not quite so common as the paralytic form. Both are affections of adult age, and women are perhaps more liable than men. Alcoholic ataxy resembles tabetic ataxy in the numbness of the feet, the occurrence of neuralgic or "rheumatic" pains, absence of knee-jerk and disorders of locomotion and equilibration. Neither weakness nor wasting of the anterior tibial group of muscles may be obvious, and in such cases it may not be easy to distinguish between the alcoholic and the progressive form of ataxy. Not unfrequently, however, in alcoholic ataxy there are indications of drop-feet, and it may be also of drop-wrist, with impaired faradic contractility of the anterior tibial group of muscles and extensors of the forearm, which are important aids to diagnosis. In such cases the walk is somewhat different from the true ataxic walk, and the patient not only throws out his feet brusquely, but steps high in order to clear his toes

of the ground. Some years ago I was consulted in a case of this kind which was diagnosed as a case of locomotor ataxy, and in which a most gloomy prognosis had been given. By attention to the points I have indicated, I was able to demonstrate the true nature of the affection, and my diagnosis was confirmed by the speedy restoration of the patient to complete health.

It must be remembered, however, that alcoholism and tabes may coexist; but, whereas tabes is, as a rule, a progressive disease, alcoholic ataxy ceases when the cause is discontinued. Also, many of the symptoms met with in true ataxy are, as a rule, absent in alcoholic ataxy. In alcoholic ataxy there is an absence of the Argyll-Robertson pupillary symptoms, of the girdle pains, of the *crises gastriques*, and of affections of the joints. There is reason to believe that many of the cases of peripheral ataxy that have been described by various authors (Djérine, and others) have been of an alcoholic type.

The following are notes of a case of what I take to have been alcoholic ataxy, which was brought to the Craven Ward, in August, 1888, by Mr. Greenwood. The patient, James A., aged thirty-five, had been drinking largely for several months previous to this date. One day in July he had a long drive in an open conveyance and got very wet, after which he began to complain of rheumatic pains. When I saw him on August 14 he was unable to walk without assistance. He complained of numbness in his feet. The knee-jerks were absent; the pupils were large and reacted sluggishly to light. In addition to the numbness in his feet, he also complained of numbness in his fingers, so that he was unable to button his clothes or raise a glass steadily to his mouth. He had never had a specific disease. He was ordered a nervine tonic, and in particular to abstain rigidly from all forms of alcohol. After a residence at the sea-side of about three months, he was able to walk twenty miles at a stretch, he had regained his knee-jerks, and was in all respects perfectly well.

We have lately had in the Todd Ward a patient, Amy C., aged twenty-five, exhibiting curious ataxic symptoms, probably also due to alcohol, or a mixture of alcohol and syphilis. At the time of admission, February 7, 1890, she had a characteristic syphilitic rash on her body, and it was ascertained also that she had freely indulged in alcohol. Her gait was markedly ataxic. She had numbness in the soles of her feet, and the knee-jerks were absent. The pupils contracted to light and on accommodation; vision was slightly defective, and there was slight diplopia for objects above the horizontal line. She remained under treatment till the middle of August, when she was discharged

able to walk fairly well, but the knee-jerks were still absent, and there was a slight unsteadiness when she attempted to stand with her feet together and eyes shut. All the other symptoms had disappeared.

In the second, or paralytic, form of alcoholic neuritis there is a variable combination of sensory, motor, vaso-motor, and trophic affections. The sensory disorders consist of pains, frequently intense and often worse at night; or of paræsthesiæ or perversions of sensation; and the sensibility is frequently impaired to tactile, painful, and thermal stimuli, and as regards the muscular sense, or sense of position.

The degree in which these various symptoms may present themselves in any given case is very variable. An old lady, aged seventy-three, whom I saw in consultation with Mr. Lewis May, suffering from her second (six years after the first) attack of well-marked alcoholic paralysis, with drop-wrist and paralysis of the extensors of the fingers, felt as if her feet and legs were encased in hot stockings, and as if her hands had been making pastry and were still covered with flour and dough. If the patients do not spontaneously complain of pains in the extremities, they invariably do so when firm pressure is exerted on the muscles of the calves more particularly, and also when pressure is made upon the large nerve-trunks of the limbs.

The motor paresis, or paralysis, specially affects the anterior tibial group of muscles, innervated by the external popliteal nerve. Not unfrequently the paralysis is entirely confined to some or all of the muscles of this group, but, on the other hand, the extensors of the fingers and wrists, as well as other muscles of the legs and arms, may also be invaded. In general, the extensor muscles suffer first and most severely. It is a curious fact that in chronic poisoning by lead, also a toxic peripheral neuritis, the extensors of the fingers and wrist are, as a rule, the first to be affected, causing drop-wrist; whereas in alcoholic neuritis the dorsal flexors of the feet exhibit the greatest proclivity, resulting in the characteristic drop-feet. While drop-wrist is the primary form of lead-palsy, drop-feet is the primary form of alcoholic palsy. Occasionally, however, the order is reversed, and cases of alcoholic paralysis occur in which the extensors of the fingers and wrist are mainly, if not exclusively, affected. A case of this kind has been recorded by Buzzard (*Brain*, vol. ii., p. 90); and there is at present in the Cheere Ward a young man, Robert J. M., aged twenty-five, who has indulged greatly in alcoholic excesses, and suffered from delirium tremens, and in whose case there is no history of exposure to lead or any trace of a blue line on the gums. This patient, however, looks like a typical instance of lead-palsy, and is unable to extend the fingers

or wrists. In the absence of any evidence of lead-poisoning this case may, perhaps, be attributed to alcohol, large quantities of which had undoubtedly been ingested. It is probable that the combined action of lead and alcohol would not only favor the occurrence of peripheral neuritis and its resultant paralysis, but might also tend to a primary localization of the paralysis in the extensors of the fingers and wrist.

In the majority of the cases of alcoholic paralysis the paralyzed parts are limp and flaccid, but in others contractures occur which cannot be overcome without causing the patients great suffering. In two of the cases which I have read to you these contractures were of a very pronounced character, and I have seen others. Vaso-motor and trophic disturbances show themselves in such forms as glossy skin, lividity or œdema of the extremities, and, very commonly, profuse perspiration. Associated with the paralytic symptoms caused by alcohol, cerebral symptoms are very common, though by no means universal, nor is there any relation between the severity of the cerebral and paralytic symptoms. Cerebral symptoms were well-marked in two of the cases which I have related. The patients are either excited or apathetic; the memory is very defective, and delusions are frequent. They will describe with great minuteness of detail things that they have done and seen, which are altogether without foundation. They exhibit strange hallucinations as to time, place, and circumstance. One delusion, which seems especially common among women who are brought to the hospital, is that they have a baby in bed with them, or near them. Two of the patients whose cases I have narrated exhibited this delusion, and I have met with it in other cases that have come under my own observation, as well as the published records of others.

Among the complications of alcoholic paralysis specially worthy of note, are gastric and hepatic derangement, as well as affections of the lungs, more particularly tubercle, many of the patients dying from this cause.

The prognosis of alcoholic paralysis varies much, and the experience of different physicians leads them to different conclusions on this point. Many cases entirely recover, others recover for a time and afterwards relapse. In others there is a steady downward progress, death ensuing from extension of the paralysis to the muscles of respiration, increase of the cerebral symptoms, exhaustion, or from complications in the lungs and abdominal viscera. My own experience leads me to give a very grave prognosis in all cases in which there are well-marked cerebral symptoms with delusions, though the existence of these does not necessarily point to a fatal termination, as instanced by

the case of Catherine B. Yet, of ten cases which have come under my observation at this hospital within the last few years, five have died, and in all of these the cerebral symptoms were a specially noteworthy feature.

Though the clinical symptoms of alcoholic paralysis were well known to, and accurately described by, some physicians of a former generation (Lettsom, Jackson), it is only within the last few years that its pathology has been established on a satisfactory basis. At one time it was believed to be dependent upon spinal disease, and was classed among the forms of poliomyelitis; but the investigations of Lancereaux, followed by those of Dreschfeld and many others in this country and abroad, whose names it would be impossible for me to mention on an occasion like the present, have demonstrated that the essential lesion of alcoholic paralysis is a peripheral neuritis, apart from any demonstrable morbid alteration in the anterior horns of the spinal cord. The same is true of poisoning by lead as well as by other metals, such as arsenic, and of the paralysis which follows certain epidemic or endemic diseases, such as diphtheria and beriberi. Some years ago,¹ at a time when the poliomyelitic theory of lead-palsy was in vogue, I argued in favor of its peripheral origin, not only on the ground of the absence of any discoverable changes in the anterior horns of the spinal cord, but, and more particularly, on the order and grouping of the muscles affected. The same arguments are applicable to alcoholic and the other forms of paralysis which are now recognized as being due to peripheral neuritis. In lead-palsy, as well as in these others, the muscles which are first weakened and paralyzed are the extensors; whereas, in poliomyelitis, the muscles are affected in accordance with their synergistic grouping in the segments of the spinal cord. In such cases the extensors are never affected alone, but only in association with the flexors and the other muscles with which they are functionally associated; and I have endeavored to show that the primary affection of the extensors and abductors is due to a greater vulnerability of the nerves of the extensors to any influence operating injuriously on the nerves as a whole. As a rule, excluding any spinal local action, such, for instance, as appears to be the case in diphtheria, in which, as you know, the palate is particularly apt to become paralyzed, the extensors of the toes and anterior tibial group of muscles generally are the most prone to suffer from any cause tending to induce a peripheral neuritis. Apparently at variance with this proposition is

¹ Localization of Atrophic Paralyzes, Brain, vol. iv., 1882.

the well-known fact that the extensors of the fingers and wrists show the greatest proclivity to paralysis under the influence of chronic lead-poisoning.

I am afraid that, with our present knowledge, it is impossible to give an altogether satisfactory explanation of this fact. It may be that the primary action of lead on the upper extremities may be due, partly at least, to the greater facilities for local absorption in the occupations under which this form of poisoning is most common. For it has been established, that the localization of lead-paralysis varies considerably under such conditions. There are facts, however, which it must be admitted are not altogether explicable on this hypothesis, and the subject is one which will bear further investigation.

The affection of the nerves induced by alcohol is essentially a parenchymatous neuritis, and is similar to the degeneration which occurs when the continuity of a nerve is interrupted at any point. The myeline sheath becomes swollen and segmented, and ultimately breaks up, together with the axis-cylinder, into smaller and smaller fragments, which are ultimately absorbed more or less irregularly. The nuclei of the nerve-sheath increase and proliferate, and, as the process advances, the sheath may be seen to be in parts empty or in other parts filled with broken-down myeline, or it may be entirely empty and converted into fibres of connective tissue. In some cases, also, there is increase of the interstitial connective tissue, and infiltration with leucocytes. These changes are most marked towards the periphery of the nerves. Under the microscopes before you are specimens showing these various conditions, some of them from the external popliteal and musculo-spiral nerves of Alice P., Case 2 (see above), others, in which the changes are less marked, prepared by Dr. Dalton, from the case of Annie C., aged thirty-three, who died in the hospital six years ago. In both these cases the anterior cornua were free from all discoverable lesion.

Changes in the muscles are seen corresponding to the severity of the process of degeneration in their nerves. The muscular fibres may show only some degree of atrophy as compared with those of a normal muscle. In other cases the transverse striation becomes less distinct, and may ultimately disappear, while the nuclei and connective-tissue elements become largely increased. Correlative with these changes are the alterations in the electrical contractility of the muscles, the chief characteristic of which is the diminution or disappearance of the faradic contractility, while the reactions to the galvanic current are those of the various degrees of the reaction of degeneration. No con-

stant morbid appearances have been found in the brain in fatal cases of alcoholic paralysis. In some, in which the cerebral symptoms have been well marked, I have observed a considerable degree of hyperæmia of the cortex; but in others this has been entirely absent, and the brain has appeared anæmic, with opacity of the membranes and thickening of the sheaths of the blood-vessels, and a large amount of subarachnoid fluid.

In the treatment of alcoholic paralysis the first requisite is the entire removal of the cause. Without this, no good can be effected. I make it a rule to cut off alcohol absolutely, and not to administer it except in threatened failure of the heart's action. The next requisite is absolute rest. The patient must on no account be allowed to use his limbs voluntarily; not at least until the tenderness of the nerves and muscles has practically disappeared. To relieve the pains and paræsthesiæ, I have obtained the best results with a mixture of five grains each of the iodide of sodium, salicylate of sodium, and antipyrin. I occasionally add to these five grains of salicin or croton-chloral. When the pains and hyperæsthesia have subsided, massage and gentle electrical stimulation, either galvanic or faradic, may be employed, but these methods should not be had recourse to in the early stages, as they are apt to increase the patient's sufferings. With this local treatment I am in the habit of administering Easton's syrup, alternating with phosphorus in doses of a thirtieth of a grain twice or thrice a day after meals. By treatment on these lines a large number of cases of alcoholic paralysis entirely recover.

THE TREATMENT OF OBSTINATE SCIATIC PAIN BY SPLINT-REST AND COLD.

CLINICAL LECTURE DELIVERED AT THE INFIRMARY FOR NERVOUS DISEASES.

BY S. WEIR MITCHELL, M.D., LL.D. (HARVARD).

Professor of Diseases of the Mind and Nervous System in the Philadelphia Polyclinic.

I DESIRE to-day to call your attention briefly to a very practical aspect of a too common nerve-malady,—sciatica. I shall not concern myself as to true sciatic neuralgia, or shall but pause to say that such recurrent self-limited neuralgias without marked organic change as occur in the fifth nerve and represent the classical form of the malady, are very rarely present in the great nerve of the leg. Their treatment, when they do occur, is simple, as a rule, and shall not detain us long; a few days of quiet, dry cups, sinapisms, care as to gouty or other constitutional states, is all we need. But even these states have a tendency to become chronic or, as I think, to terminate in true congestive and inflammatory conditions, while, generally, that with which we have to do, and which we call sciatica, is from the first not a functional disorder, but an organic disease represented by inflammations of sheath, connective tissue, and neurilemma, and ending in a variety of states, the offspring of these troubles. Taken early and vigorously treated, such attacks,—and I refer now to the pure cases of true neuralgia,—however painful, are manageable and may in the future be kept at bay if—and it is a large if—enough of care be given to lift the nutritive state of the whole body. My present object is rather to point out for you what to do in turn for cases of grave sciatica, or, as I prefer to say, sciatic neuritis.

A brief summary of a case will suffice. A man has had recurrent attacks of sciatic pain,—at last the disease is constant. He cannot stand long or walk without pain. It is worse after four P.M., whilst fifth-nerve neuralgia is worse in the forenoon, and if this subject is of interest to you I refer you to Captain Catlin's case of traumatic neuralgia for curious details as to hours of maximum and minimum pain.

The pain is worse in places, notably at the exit notch and where the nerve passes through fascia, as might be due to pinching at these localities. But also there are often other places at which intensest pain is felt, and these vary in situation and may be incidental to extreme inflammation at the sites in question. These seats of worst pain need attention during treatment. Certainly, of all of them the notch is the most sure to be the place of extremest pain, as is seen in certain cases when to stand on the affected leg causes such violent anguish at the exit point that the man may fall as if shot. In others it is a backward or forward motion which is more competent to excite pain, or to stretch the nerve by extreme extension of the leg causes an increase. Years ago, before I knew how to treat sciatic neuritis, I saw a man who had been in bed for years, because to stand, even on crutches, made him faint with pain. In this instance I had the nerve laid bare and found a quite local inflammation. The nerve was swollen and within the sheath lay a dense covering of organized lymph, and, curiously enough, some small grayish blood-clots partially organized. I suspect that there may have been a large hemorrhage within the sheath. The man recovered. I reported a similar case years ago, due to a kick. I cannot be sure as to its exact likeness to the case last mentioned, for no operation was done, and under treatment the man got well. He was very much wasted and there was an obvious swelling at the exit point. Once also I saw a woman whose pain was due to an enlarged gland at the point of emergence of the nerve. The woman before you illustrates what we often see. A silk-weaver by trade, much afoot, she has had sciatica, not of an extreme type, for a year. She finds a walk not very hard unless it be so long as to tire. To stand soon causes ache, but one action, that of rising up a stair on the leg, gives rise, as the body bends forward, to acute pain.

And now to return. The old sciaticas are most obstinate. They last for months or years, destroy the power to work, cripple, enfeeble, and torment. At last, too, they trouble the nutrition of the leg and in variable degrees affect its sensibility. There is no need to dwell on their history. I pause only to add that true double sciatic neuritis is rare. Of course, in general neuritis, which is, as a rule, toxic, it is to be met with. Pain in both nerves is apt to exist with pain in the sacrum or loins, and to be due to spinal or caudal disease. Generally, old sciatica is single.

But suppose the too common case of severe single sciatic pain having lasted for months. The man limps about or goes on crutches. He is in bed a few days, and then up for a while; continuous work is

out of the question. His nights are miserable, and he may or may not use opiates. Now, what shall we do with him? We eliminate rheumatism, gout, syphilis, trauma, pelvic growths, and see that we have a case of neuritis with tender points here and there, and the usual effects on sleep, appetite, and local and general nutrition. Many years ago I taught that the most certain indication is to secure rest. Now, rest in bed is no new idea,¹ but do not imagine that merely keeping a man in bed is the rest I mean. Put the man in bed,—that all of us do,—but also put his leg at rest with a long old-fashioned splint such as used to be employed in fractures of the thigh. It should extend from axilla to foot, and be held in place by light bandages, and in some cases it is convenient to have it made with a joint at the knee, and a mode of fixing this rigidly at an angle. Another form, which if we use rest with cold has to be employed, is a roughly-moulded anterior splint, with a wooden attachment carried up laterally to the waist or axilla, or a wire frame of like shape. But no matter what form we employ to keep the limb at rest, certain points need attention to lessen the annoyance and evil of local rest thus enforced. Take care that the ankle is so sustained that the heel does not carry the weight of the leg. Be desirous of having the knee in gentle flexion, and change this flexion angle a little, a very little, at each dressing. After a few days of undisturbed rest, at each dressing carefully flex and extend all the joints, but do this slowly and slightly, our object being to prevent too great stiffness, the common evil which follows the use of a splint. It is not essential, and only advisable if done with caution. Use enough bandage to keep the splint in place, and no more, as you do not or should not wish to overheat the limb or disturb its circulation. Finally, there are people who cannot bear a long splint, and in these some good may be had out of an anterior suspension-splint, taking care to have the limb lifted but little.

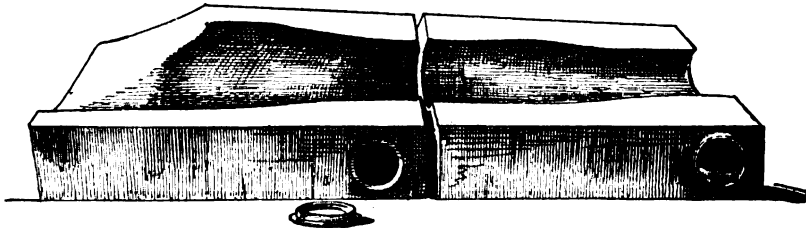
My friend Professor Osler has lately told me how very valuable he has found this simple measure in chronic sciatic pain. Certainly it sometimes surprises one by the quick relief of pain it causes. And then, too, it is so simple and so natural. With it, and such general aids as I shall speak of by and by, you may overcome many sciaticas which have defied more elaborate treatments. But suppose that it eases and does no more, or that it does not help at all, or that there

¹ In a lecture on Rest in Nervous Disease (Seguin Series), 1875, I spoke of the use of splints in sciatica, and also of "the steady use of ice-bags." Since then, in some of the reports of my clinics, these means have been again advised.

remain pain-points. What next is to be done? and here for me the roads divide. If the man is in fair condition and the case not over, we will say, three months old, I like to continue the splint, and use daily Paquelin's cautery button on or over the pain-points, being careful not to destroy the skin so deeply as to injure the sensitive apparatus, through the stimulation of which I am trying to influence the vascular conditions of the underlying nerve.

And now let us suppose the case to be yet more grave, to have lasted a year, or let us presume that we have in a measure failed with use of the means just now described. What resource have we yet left to us? In either case I employ dry cold, as I have now done for very many years, and I use it either in conjunction with or without absolute rest. Success in medicine depends often on attention to details, and as concerns employment of dry cold in sciatic neuritis this holds good.

In old and obstinate cases an ice-bag of caoutchouc is kept on the painful nerve-tract day and night for two or three weeks. This is to



Tin splints with ice-chambers. (A later modification has been made, as indicated in the description, consisting of a splint to receive the thigh and leg, the ice-chamber merely running under the inferior surface of the splint in the position corresponding to the course of the sciatic nerve.)

be but moderately filled with ice and water, so as to lie flattened. The Davidson bags are badly made; the Chapman spinal bags are better, though costly and difficult to procure in America. In any case, we desire to cover the whole length of painful nerve, and a breadth of three to four inches.

In this hospital we now prefer to place the leg on a tin or copper gutter (see figure); on the under part of this is the ice-case, three to four inches wide, with a screw opening one and one-half inches wide on the side, made to fit the thighs right or left, whilst another at need receives the calf. These vessels have bevelled edges at each end. There are large openings on the side closed by screw covers, and these cases being filled with ice and water, are then surrounded with some good non-conducting stuff, so arranged as to leave a naked space of metal about three to four inches wide over the nerve-trunk. When a ther-

mometer is placed between the calf and the tin box filled with melting ice, the resultant temperature, the product of the skin-temperature and the ice, is about 59° F. It may rise above this, but does not fall below. By using ice in saturated brine with excess of salt, as long as the ice is not melted or the excess of salt dissolved, the resultant temperature is as low as 46° or 47° F. Usually, I am contented with the cold of melting ice.

The effects of dry cold thus used in sciatica are sometimes most remarkable, but, despite the fact that I have clinically described its use for nineteen years, and have again and again mentioned it in print, the method has been little used by others.

When, owing to use of local rest and cold, the pain fades away, and at last is only felt at night or in spots, we lessen the length of use of ice until it is only applied at night, or an hour or two twice a day. In a like cautious way do we get rid of the splint. If any pain-points linger, use of the cautery over them is often valuable, but at this stage I dislike cauteries, because this is the time when massage is so admirably helpful, and sores anywhere limit its value. I like now to have the muscular masses of the leg gently kneaded, without grease. I want also to have a gradually deeper surface-rubbing in a downward direction (*effleurage*, if you like a French name) over the nerve-trunk. Here again some care is required. Let the rubber keep the rest of the limb covered. Let him arrange the patient on his face, with pillows so placed as to be comfortable. Then let him slowly and gently, with the flat hand, extended fingers, or heel of the hand, follow the nerve-trunk downward with gentle, deliberate friction, increased in force day by day. A half-hour of this twice a day is desirable. Let him deal with sections of the nerve at a time, with most attention to such as are yet painful, and let this treatment be done without any form of grease, until after a time the increasing pressure begins to wear out the skin, when he may use a little vaseline or other like agent.

When the pain is quite gone and the limb may be gently moved and handled without distress, it is still well to exercise extreme caution as to how we get the patient up. It is wiser for a while that at first he stand aided by crutches and then walk with them, and not sit up, or not sit up long, as this brings pressure on a nerve which may still be sensitive. You will doubtless have remarked that the people in our wards who have sciatic neuritis are nearly all pain-wasted, thin, and anæmic, poor eaters, and with stomach and bowels out of order. If the physical failure be extreme it is easy, especially in a hospital, to aid internal tonics by external means. I refer, of course, to general

massage; and here I wish to impress on country physicians that almost any massage is sometimes better than none, that most able-bodied, intelligent persons can learn to use massage for mere general muscle-kneading, and that the books about massage, being mostly written by rubbers, are full of needless requirements, and that these people make a great deal of mystery about things which are commonly simple enough. We want a book by a man who does not personally knead patients, but who has watched with care its use and can criticise its value from the stand-point of the physician.

Some kind of general massage would be helpful in these cases from the day we put them in bed, but on the whole *at first* it were best to avoid the diseased limb, and to let the back alone, because to rub it involves the moving of the patient from back to face. Also, if early massage be used the operator must be careful not to roughly shake his patient so as to disturb the limb we desire to keep at rest.

Observe now that so far I have said almost nothing as to general treatment. In nearly all of our cases iron and cod-liver oil, if well borne, are used, and milk or soups are given between meals.

To sum up, we rest the body even to using the bed-pan and urinal. We absolutely imprison the leg, so as to insure a nearly motionless rest. We use cold locally at need. We employ tonics and extra diet and general massage as far as available, and later also local massage. It is, as you observe, a modified "rest treatment," so called, and that is indeed a treatment which you will often find to be available in other local pathological conditions.

I have said no word as to the use of electricity. Strong galvanic currents may be of service in the milder forms of sciatic neuritis, but are as painful and less efficient than the cautery. If the wasted limbs do not gain in size and tone at the close of a treatment, the stimulation of induction currents may help us to a more rapid result.

I have said nothing of the resort to surgical means, such as nerve-stretching. This omission I now repair by stating that in my own experience, and since this operation came into use, I have never met with a case of sciatica which obliged a resort to it. I do not say that I never shall ask for this surgical aid. I have seen nerve-stretching cure sciatica, but, for many reasons needless to state here, I prefer to see first what medical means will do, and beg you to bear in mind that however much extreme measures like this operation and oophorectomy address themselves to the imagination, they are liable to fail, like all other means. In double sciatica, due probably to caudal disease, I am far more willing to think of this surgical aid.

I trust that I have now made clear to you what I know as to the treatment of sciatic neuritis. It does not consist in doing this or that indifferently, for there are many ways of treating curable diseases. It is a systematic effort to secure certain desirable therapeutic ends with the least possible coincident injury. We are using rest, we add passive exercise of massage, we employ cold locally, and are careful as to feeding, and give oils if possible, and see that the other leg and the body be not chilled, and are kept warm in flannels. It is this systematic practice which wins the best victories and achieves permanent results.

I have once in the course of this lecture expressed surprise that this simple treatment has not been more often followed; but while a single drug newly introduced has oftentimes immediate and large acceptance, the use of distinct plans of methodical, well-considered treatment but slowly win their way.

I have so far said nothing as to the mode in which rest acts to arrest pain, or, better, in which motion acts to increase pain. Any case of fifth-nerve neuralgia is a lesson as to this; to laugh, to talk, to swallow, brings on paroxysms. Possibly, just as a voluntary motion reinforces motor ganglia, and so increases the amount of a remote reflex act like a knee-jerk, the volitional act may reinforce the appreciatory capacities of a sensory centre. But beyond this is the fact that all inflamed tissues do better at rest, a doctrine which nature is not slow to teach. I have taken one of her hints and carried it out. As to why cold is helpful seemed once easy of explanation, until I learned by experiment how difficult it is to chill the tissues deeply. Our application of cold to the surface, in the continuity of a limb, has only a reflex activity, and this is all we can say.

As concerns cold of various degrees, I had last year a mass of notes which have been lost. We tried to use freezing mixtures and carried tubes through them, in which tubes were made to circulate alcohol, glycerin, etc. The method is available, but difficult. I am not sure that the use of a greater surface-cold than 32° F. is valuable. It is yet to be tested. I may add that in neuritis of extremities, as in the painful alcoholic form, alternates of extreme heat followed by ice-frictions are of the utmost value.

It were easy to relate cases treated by the double means I have so carefully described, but let it suffice to say that I have many times seen it triumph where all else had failed, and that it is more apt than other means to effect permanent cures. Last week you saw at my clinic the woman who was in the McCormick Ward last year. Rest

and ice cured her. She came to say to me that a year of hard labor had left her well. She had been in nearly constant pain for two years, and was made well after much medical treatment and a failure to be cured by stretching the nerve.

I recall the case of a man for whom I first used this treatment, now nineteen years ago. He had been in bed a large part of a year with ferocious sciatica, and had been much treated for seven years. I was asked to decide if it were advisable to *cut* the sciatic nerve! He was so thin that I could feel easily the enlarged and tender nerve, for, having once weighed one hundred and seventy, he had lost eighty pounds. He used rubber ice-bags for over three weeks night and day, and had the leg kept slightly flexed and at absolute rest by an anterior splint. Also I gave oil and fed him well, and made a perfect cure, good to this day. If I had then known what now I know of massage and rest treatment in general, I should have done still better,—that is, I should have been a shorter time in restoring the limb to full and active usefulness, and might have had less trouble with the dyspepsia my large feeding caused. But as to this, painful digestion or annoying digestion may still be very competent digestion, and the need to feed this man was greater than the need to let him have less diet and more comfort. When he got about the digestion became normal.

Laryngology.

STRICTURE OF THE LARYNX.

CLINICAL LECTURE DELIVERED AT THE JEFFERSON MEDICAL COLLEGE.

BY J. SOLIS-COHEN, M.D.,

Honorary Professor of Laryngology, Jefferson Medical College, Philadelphia.

GENTLEMEN,—As the principal subject-matter for to-day I will present to you a case as an object-lesson from which you will be taught some very important practical points not detailed in your ordinary text-books nor discussed in your didactic lectures. You will notice that this boy, a well-nourished lad, thirteen years of age, wears a handkerchief around his throat, and that he has a whispering voice. You will also note that the voice is a laryngeal whisper and not an oral one. You should always notice the difference between these two forms of whispers. An oral whisper indicates that the vocal bands are not in action at all. A laryngeal whisper indicates that there is some obstruction preventing approximation of the vocal bands.

One of you will be good enough to remove the handkerchief from the neck of the lad, and it at once becomes evident that it has been worn to hide something. This something is a silver tube which projects from within the trachea. You will note also, please, that the orifice of the tube is plugged with a cork. Nevertheless, the lad breathes freely without any impediment. A tube in the trachea, and yet the fact that the patient breathes through his nose despite occlusion of the tube, shows that he gets enough air alongside of the tube in the trachea, without having to depend upon his breathing through the tube at all. Here is an important point to bear in mind,—the size of the tracheal tube. It should be as large as is compatible with perfect freedom of movement in the trachea. You should never use a tube large enough to fill up the entire calibre of the trachea, as you may cause ulceration from pressure. You must not use one so loose that the lower orifice shall press anywhere on the wall of the trachea. Cases are on record of fatal results from ulcerations of the walls of the trachea and penetration into blood-vessels.

When the patient wearing the tracheal canula desires to use his voice, it is usually necessary to occlude the exterior of the canula with the finger or with some automatic contrivance, in order to prevent escape of the expiratory current of air during phonation, and to deflect that current upon the vocal apparatus. It sometimes happens, however, as I showed in a few instances to my classes in this college years ago when I was more actively associated in its teachings, that a tracheotomized patient has such a copious volume of air that he can speak satisfactorily without occluding the orifice of his canula at all. When tubes are used which fill the trachea, it becomes necessary to have the upper portion of the canula perforated, in order that the air from the lungs shall reach the vocal apparatus, to enable the patient to use his voice. When the canula does not occlude the calibre of the trachea, a sufficient volume of air will pass by the sides of the canula to set the vocal bands into phonal vibration. Nevertheless, it has become very common for surgical-instrument makers to make an opening—a fenestra, as it is technically called—in the tracheotomy canula. I pass a number of such fenestrated canulas around: some of silver, some of aluminium, some of other metals, some of vulcanized rubber.

You will notice that the fenestræ are in the horizontal portion of the tubes. Now, nine times out of ten these fenestræ are made so far forward towards the exterior extremity of the tubes that they will not be in the trachea at all when the tubes are in position, but will be located in the track of the wound exterior to the trachea, where their presence will produce excessive granulations. When a little farther back, excessive granulations are produced at the edges of the tracheal incision which straddles them. The granulations may dip down into the lumen of the canula, and not only obstruct the breathing of the patient, but seriously interfere with the withdrawal of the canula for purposes of cleanliness.

In order to fix your attention prominently upon this very important and insufficiently appreciated point, I will relate to you an instance which occurred in a case of mine which has become historical,—not for the intrinsically important features of the case itself, so much as to illustrate the fact that serious injury may be produced by these fenestra. It is my case of epithelioma of the larynx alluded to by Professor von Bergmann in his account of the fatal case of the late German Emperor Frederick, upon whom he desired to perform the same operation at the time the case was taken out of his hands, having successfully performed it upon another patient three years previously.

About twenty-four years ago I opened the larynx of a gentleman

and removed an epithelioma therefrom in the presence of a distinguished galaxy of surgeons, including the two late Professors Gross and the elder Pancoast of this college, Professor Jones of Chicago, the late Professor R. J. Levis, at one time of this college, the late Professor Elsberg of the University of New York, Professor Agnew of the University of Pennsylvania, Professor Brinton of this college, and the late eminent surgeon Dr. John L. Atlee of Lancaster, the patient's physician. After I had operated on that patient,—who, let me state, is still living, and has visited me at my office only a day or two ago,—he continued to wear a tracheotomy-tube which I had placed in his trachea a short time before the thyrotomy and the extirpation of the neoplasm. I told him that he would have to wear that tube from six to eighteen months, in order that any recurrence of morbid growth could be readily attacked from above or from below, as might be, without splitting his larynx open a second time.

In the mean time we looked after his general health, which had become somewhat impaired by the severe measures to which he had been subjected, and advised him to travel a while in Europe. I gave him a list of surgeons in the medical centres of Europe, to whom he might apply should he need their services, and to one or other of whom he should submit his larynx for inspection at intervals of a month or so to determine the presence or absence of recurrent growth as might be. But I especially warned him not to let any of them persuade him to have his tube removed, and not to let any of them put in a fenestrated tube, as I knew they would be likely to do, for I felt certain that if they did so he would have trouble with it. Nevertheless, in Paris he was induced to have his tube taken out and a fenestrated one inserted in its stead. As predicted, exuberant granulations grew, and finally projected into his tube. One day, being unable to withdraw his canula, the man was nearly suffocated, and sent hurriedly for his physician, who had to tear the tube away bodily, cauterize the surfaces of proliferation, and replace my tube. The patient was confined to his hotel for some weeks in great pain, distress, and peril; and finally returned to Philadelphia in safety with the same tube that had been inserted before he left. After the prescribed period had elapsed, I took the tube out, and he has not had occasion for its reintroduction, nor has he had any recurrence of morbid growth.

I call your attention to this to show you that there is no necessity for fenestræ in tracheotomy-tubes. Another point: where the patient has to wear a tracheotomy-tube for a number of years, as the patient before you has had to do, and even after ordinary operations for croup,

it is always best to have two tubes. One should always be clean. They should be changed on alternate days. One should be a little shorter than the other, so as to vary the points of any pressure on the trachea or on the track of the wound. In certain classes of individuals you will find that the patients not only neglect to change their tubes, but that they keep them in a long time without even cleaning them; and in this way more or less corrosive destruction of the tubes necessarily takes place, exposing the patient to dangers from direct injury to the tissues by the jagged edges of the tube, or to its separation from its collar and its escape into the trachea as a foreign body.

The ideal tube should be made out of one solid piece of metal, and best of silver. I have sometimes used leaden tubes made in this way, such as you see here, for the first few days after an operation; and I believe that the presence of the lead acts favorably upon the track of the wound. Usually, however, these metallic tubes are made of rolled plates, jointed and soldered. Wherever the tubes are soldered there are two metals in contact, one in the tube itself, the other in the solder. Wherever two metals in contact are immersed in a saline solution, there an electro-chemical decomposition is set up. Now, the secretions which accumulate around the tubes are alkaline, and so at the two points where the two metals are joined all the essentials for electro-chemical decomposition are present. Hence there is corrosion of the tubes from galvanic action. I pass around for your inspection a number of tubes thus corroded; all are in a dangerous condition, some of them very precarious. Not only are the rough edges of the metal apt to produce ulceration, but after a while the tube may separate from its shield and drop down into the trachea. I have had several cases of this kind where the tubes got loose and dropped down into the trachea, and simply because the patients were too careless to take care of them. I have known patients to wear the same tubes seven years or more, and never take them out to clean them. Of course there is not so much danger to the patient's life on account of the tube dropping into the windpipe as there would be from most other foreign bodies, because it is of such a shape that the patient can breathe through it. It can, too, usually be easily lifted out by running through it a thick copper wire the end of which has been bent into a blunt hook to catch around its distal extremity.

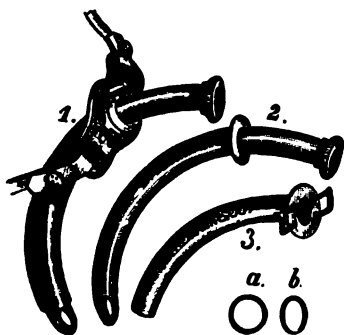
Another point to which I would call attention is the superiority of silver, or metallic tubes generally, over hard rubber tubes. The reasons why you should use metal and not hard rubber tubes are: First, because the hard rubber breaks easily and the tube may escape

into the trachea; secondly, because it takes up more room: it is thicker, and thus cuts off the patient's breathing-space to a greater extent than a thinner metallic tube. The most important point, however, is this: a silver tube becomes tarnished by the secretions. If any necrosis of tissues occurs around the tube in the track of the wound or in the trachea, as is so frequent after tracheotomy, especially in cases of croup or diphtheria, it soils the silver tube and does not soil the rubber tube. Hence, when you take out the metal tube and see a black or a discolored spot upon it, you are made aware of the danger; and you can then relieve the pressure to which it is most likely due by putting a compress under the collar or shield of the tube, above or below as may be required.

Another point of minor importance to which I desire to call your attention is a very neat way of having your tapes attached to the collar of the tube with buttons and button-holes, instead of having them sewed on. (See Fig. 1.) Then, when you want to change the tapes, on account of being soiled with blood or with other products, you do not have to pull the tube out and leave it out for a time while new tapes are being sewed to the collar. You just unbutton one side, and replace it with a new tape; and then repeat the procedure on the other side. Always have one tape shorter than the other, so that you can fasten the knot on one side of the neck, and not be compelled to raise the patient's head to unloosen the tube or take it off, as you have to do when the tapes are of equal length and are fastened behind. You will note, too, that these tubes are provided with a catheter-shaped guide to facilitate introduction without stretching the lips of the incision.

There is, in the case of tracheotomized subjects, a point of physiological interest to which I wish to call your attention. You are aware that the air inspired into the lungs receives heat and moisture in its passage through the nose. Some physiologists and some laryngologists contend that the air thus breathed becomes thoroughly saturated with moisture in the nasal passages, and is therefore incapable of receiving

FIG. 1.



TRACHEOTOMY TUBES FOR ADULT (one-half measurement).—1, tube with pilot, and tapes secured with buttons ready for insertion; 2, perforated pilot; 3, inner tube; a, section of lumen of tracheal extremity of inner tube: circular; b, section of lumen of tracheal extremity of inner tube: oval.

any more moisture from the lungs. They infer from this that our notions are wrong that any of the halitus of the expired breath, which we know will condense upon a polished surface, is due to saturation of the air from the lungs. While experiments with glass tubes upon the normal subject may confirm this inference, clinical observation on the tracheotomized patient does not support the opinion. The air expired from the canula of a tracheotomized subject with complete occlusion, above the artificial orifice will sully a polished surface and condense in the atmosphere on a cold day, just as will the breath from the nostrils of the normal subject. A tracheotomized patient of mine, with practical occlusion of the glottis, who could not bear his canula to be stopped up even for a minute, was very much annoyed in winter-time by having people come up to him and tell him that his collar or neck-cloth was on fire. He wore a cloth over his canula, and the expiratory current of air escaped above it. The stream of condensed moisture issuing from his neck behind his collar looked like smoke, and led some of the passers-by to imagine that a spark from a cigar had fallen on his neck-gear and had set it on fire. While the air breathed through a tracheal canula becomes heated by the warmth of the garment the patient may wear over his tube, its moisture in cases of complete occlusion must certainly be derived entirely from the tracheo-bronchial tract and the pulmonary spaces.

And now, as to the history of the case before you. Eight years ago this boy had croup or diphtheria in Denver, Colorado, followed by multiple papillomata in the larynx, for which Professor Davis, in the college there, performed tracheotomy when the lad was almost in the agonies of death. In consequence of inflammatory action, papillomata developed here in the larynx, as they often do after measles, croup, and diphtheria, and sometimes after whooping-cough. I know of no more frequent cause of papilloma in the child than the inflammation in the larynx accompanying measles. The physicians were unable to remove the papillomata through the mouth, on account of the youth of the patient, and Dr. Davis then split the larynx and removed the growth. Recurrence ensued, and two years later Dr. Davis kindly sent the patient to me. I sent him to the German Hospital for operation. Recognizing my inability to remove the morbid growths through the mouth, I split the larynx open a second time and removed the growths thoroughly by direct access. Although we did not practise antisepsis then as now, the reaction was so slight that the next day, when I had just repeated a similar operation on an adult, this child was found standing by in his night-dress to see what the doctor had done

to him the day before. He got perfectly well. A few weeks afterwards, on account of a recurrence of these growths, I split open the larynx a third time. A few months afterwards I was compelled to open the trachea below the tube and remove some growths there. I think I performed the last of these operations some six years ago. Since then there has been no occasion for a major operation; but there has been a great disposition to repullulations in the parts originally implicated, and I have taken out several masses through the mouth upon various occasions and at varying intervals. The result of these repeated proliferations of tissue and removal by evulsion and by electric cauterization has been to produce an irregular stricture of the larynx at the glottis, so that the lad has been compelled to wear his tracheotomy-tube as a permanent fixture. I made repeated attempts at dilating this stricture as opportunities presented in the very irregular intervals of the patient's attendance, but without much progress. The methods pursued will be described to you a little later, in connection with some general observations on the treatment of stricture of the larynx.

Some two years ago I thought I would attempt to relieve the boy of his tube, and sent him to the Children's Hospital and put in an intubation-tube, which he wore for several weeks. I did not see that it did any good. After removing the tube I thought the parts were more constricted and the passage for air smaller, and I replaced the tracheotomy-tube. Shortly afterwards I removed the tracheotomy-tube and had the child carefully watched, thinking perhaps he might be able to do without it; but a few days later he was brought to my office in the arms of a nurse, black in the face and unconscious,—in fact, almost asphyxiated. I seized an ordinary trocar and canula that was lying on my table and plunged it into the trachea at the seat of the original orifice, withdrew the trocar and left in the canula; and a few minutes later, after respiration had become re-established, I enlarged the wound and put in a tracheotomy-tube. He has worn a tracheotomy-tube ever since, though not the same tube all the time. I determined to defer further efforts at relief until the period of puberty should be reached, and which is now approaching.

For the last few months the boy has been able to breathe with the orifice of the tube closed with a cork. And now I propose to have him stay in this hospital a while where he can be watched, while we make another attempt to see whether he can do without the tube.

You know that after puberty the larynx in the male grows very rapidly. Before that period the larynx of the male and that of the

female are much the same, and the voices are very much the same; but as the boy grows to manhood his voice gets deeper and more sonorous, and he accordingly becomes able to take in a larger volume of air.

This case, then, is one of stricture of the larynx, the result of repeated operations for the removal of multiple growths near the glottis; a stricture which has long restricted the breathing-capacity of the patient. But now, as you see, the patient breathes with the tube occluded by a stopper, and I think that he may be able to breathe without it. I do not intend to withdraw the tube and then close the exterior orifice at once. That would not be prudent. I have provided here a plug to place in the track of the wound, so that it will not close up after I have removed the tracheotomy-tube. It is cylindrical as far as it goes into the track of the wound. Beyond that point it is merely a thick wire with a bulbous extremity to facilitate its introduction. There is rarely any occasion to freshen the edges of a tracheal fistula of this kind to make it close. Closure is often complete after a few hours; almost invariably after a few days. Sometimes the outer opening will close almost immediately after removing the tube. In the very case which I detailed to you in exemplification of the uselessness and danger of a fenestrated tube, the orifice closed so tightly within ten minutes on one occasion that I was compelled to administer chloroform and enlarge it by incision so as to reintroduce the tube. It was this occurrence that taught me always to have a clean tube ready to replace the one withdrawn. The plug prevents this constriction of the orifice

FIG. 2.



Apparently cured stricture of larynx; extreme inspiration. (After protracted treatment by dilatation.)

by filling up the track of the tracheotomy-wound just as the tracheotomy-tube does, and the slender wire in the trachea itself does not interfere with the breathing. Two tapes are tied to it, as to the plate of the tracheotomy-tube, so as to secure it around the neck. Thus protected, the fistula remains patent, and the resident physician can put in a tracheotomy-tube if necessary, in case the boy cannot breathe without it.

This boy has a deformed glottis (Fig. 2), and the vocal band on the left side is adherent to the ventricular band above it, and does not move in phonation, but remains in the middle line. That is why the boy has this peculiar voice. The constriction prevents the vocal bands from coming together, and there is no truly vocal sound. Besides this, the larynx is a very small one. Under ordinary circumstances I would not trust it, for,

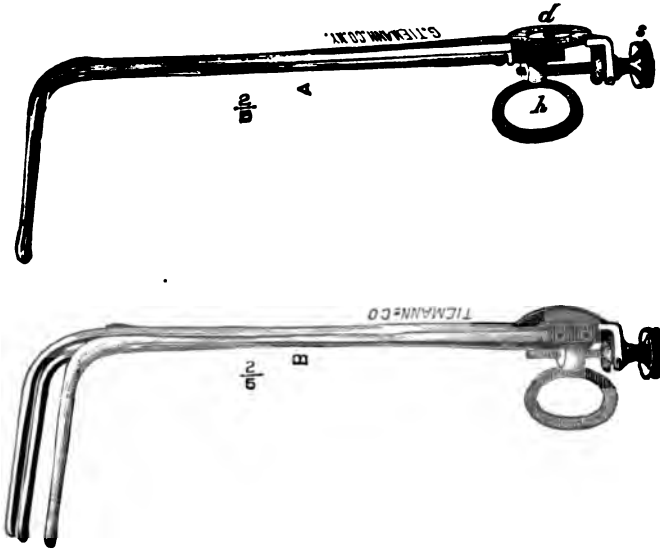
when a larynx is constricted by chronic disease, it takes but little acute inflammation to close it entirely. But, as the lad has become accustomed to his constricted glottis, he may probably be able to continue to breathe through it. It may even become dilated under the influence of the compressing and somewhat forcible inspiratory current of respiration. We find, too, in chronic disease, that the larynx gradually becomes accustomed to gradually increasing stenosis, so that the patient can live comfortably with a breathing-passage so small that it would be certain to produce suffocation were the occlusion to occur suddenly as the result of accident or of acute disease. In chronic diseases, therefore, we do not run the risk in trusting to a constricted orifice that we would run in acute disease.

And now, gentlemen, a few remarks upon the general treatment of stricture of the larynx, which is essentially the same, as far as the mechanical features are concerned, no matter what the cause of the stricture. It is caused by inflammation and infiltration of the tissues and the concentric cicatrization of breaches of continuity. It may be due, as in the case before you, to recurrent morbid growths and the operative procedures for their eradication. It may be due to syphilis, to tuberculosis, to lupus, and other diseases, or to surgical or other injury. The treatment is by dilatation, like that of stricture in any other passage,—the urethra and œsophagus, for example; only it is considerably more difficult, on account of involving the narrow portion of the respiratory tract, the patency of which must be preserved at all hazards. Graduated dilators of various kinds, so bent as to be readily introduced through the mouth, have been devised. When they are to remain in the passages more than a very few seconds at a time, they should be perforated so as to permit the passage of the respiratory currents of air. Especially is this necessary when the patient is not wearing a tracheotomy-tube. When the patient wears a tracheotomy-tube, solid dilators are sometimes used. They may be retained for hours at a time with impunity to the breathing, as they are inserted above the orifice of the fistula in the trachea. As the treatment progresses, larger and larger dilators are used, until the normal calibre of the narrowest portion of the laryngeal cavity has been attained, or until it becomes evident that no further dilatation is practicable. If the calibre of the constriction becomes sufficient for respiratory purposes, the tracheotomy-tube is withdrawn under precautions somewhat like those that have just been shown you. Treatment by gradual dilatation is a very protracted procedure. If you ever attempt it, be frank enough to your patient to state that it will take a period varying from six to

eighteen months to accomplish any permanently satisfactory result. Your experience will then be like mine. You will lose a number of patients who will waste time in attendance upon practitioners who give them more encouragement; but you will have the satisfaction of curing most of the few who do remain under your care, while your percentages of successful results will be better. I have succeeded in permanently curing several desperate cases of stricture of the larynx.

And now let me give you one important piece of advice in commencing this treatment. Remember that you have a concentric constriction, more or less irregular of course in the majority of cases, but practically concentric and retractile. You can stretch it with suitable contrivances, but when you relax the stretching force the constriction will recur, and may even become greater than when you began, as it did in this boy, who wore an intubation-tube with perfect safety for several weeks. I should, therefore, recommend you to nick the stric-

FIG. 3.



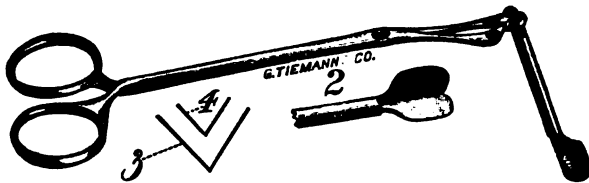
MACKENZIE'S DILATOR (two-fifths measurement).—A (closed).—h, ring-handle; d, dial-plate; s, dilating screw. B, open.

ture with an exposed or guarded knife, as may be, at one or more of the most constricted portions, before you leave any dilator in the stricture for therapeutic purposes. In this way you enlarge the stricture before you dilate. Then with some special dilating contrivance you may stretch the stricture, and will be able to insert a much larger

dilator than otherwise. When the fresh wounds cicatrize around this dilator, you will probably have gained a little, after a while a little more in the same manner, and so on. The permanent pressure of the dilator, too, promotes absorption of resorbable effused products in the constricting tissues, and thus tends to enlarge the constricted portion of the passage permanently.

I show you a number of instruments, machines we might call them, devised to dilate a stricture of the larynx. They may be used to tear a stricture apart at some points by divulsion, but this use I do not recommend. One of the most ingenious is this device of Sir Morell Mackenzie (Fig. 3). It consists, as you see, of a three-bladed instrument with the laryngeal curve, the terminal or intralaryngeal portions of which are separable by turning a screw at the proximal extremity. Attached to this screw is a dial-plate so graduated as to indicate the calibre reached by the blades at the other end. Several other instruments of this kind have been devised by other practitioners. Mackenzie's is the best, because the blades separate in such a way as to represent the normal shape of the distended glottis. But they all have

FIG. 4.



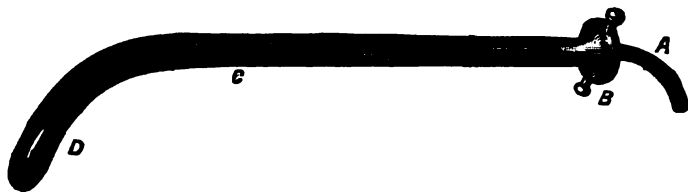
COHEN'S DILATOR.—2, blades open ; 3, anterior ; 4, posterior surface of open blades.

the objection that the pressure is made only at certain points. It is not always the case that dilating force at these points will rupture a stricture or even dilate one that has been previously nicked. I far prefer an instrument devised by myself some sixteen or eighteen years ago, and then used for the first time upon a gentleman from Zacatecas, Mexico, sent me for the purpose by an old friend, Dr. Prevost, of that city. It is composed, as you see (Fig. 4), of two flat rectangular blades which by scissors-movement at the handle are made to move upon a hinge anteriorly, so that when opened they represent precisely the triangular shape of the distended glottis, while they press upon the entire surface of the two sides of the triangle ; the same sides pressed upon by one point only in Mackenzie's instrument and other instruments of that class. In this instrument the pressure is uniform, dilatation is more systematic, regular, and effective, and is less injurious upon the

parts pressed upon. I have seen no instrument devised since which appears to me equal to it.

The stricture having been nicked and dilated, the procedure may be repeated at intervals to prevent reconstriction. The instrument I have just shown you was used daily, or almost daily, by the patient himself for a prolonged period. A better method, however, is to follow each nicking and stretching by the introduction of catheter-like perforated dilators of the configuration of the glottis, such as I show you here, and which are the device of Professor von Schrötter, of Vienna (Fig. 5). It was by the use of these dilators that we have been able to overcome the stricture in the case before you. Here are a series of such tubes made of hard or vulcanized rubber, and graduated from the smallest to the largest size; and in connection with them here are a series of solid pewter plugs, externally of the configuration of the glottis, which are intended to replace the tubes for hours or days

FIG. 5.



SCHRÖTTER'S PERFORATED DILATOR.—A, extension tube to direct products of cough downward; B, external extremity of dilator; C, body of dilator; D, catheter-like inner extremity.

at a time in cases of stricture in which a tracheotomy-tube is in use. The method of treatment is essentially as follows: As large a dilator as practicable is introduced and allowed to remain, according to the patient's tolerance, from five minutes to half an hour or longer. It is then removed, and a dilator of the next larger size is immediately introduced and withdrawn a few seconds or a few minutes later. If the patient is wearing a tracheotomy-tube, the corresponding size of solid plug is introduced into the larynx and allowed to remain a number of hours or a day or longer as may be. These plugs, as you see, are three-cornered cylindroids with rods running through them. The upper portion of the rod is perforated so as to carry a string by means of which the plug can be withdrawn. The lower portion of the rod is knobbed so as to be seized in the grasp of a pair of forceps, which is introduced into the tracheal canula through a large fenestrum in which the lower end of the plug penetrates a short distance. Latterly Schrötter has abandoned the knob, and has simply obliquely

perforated the lower extremity of the plug itself, which he fastens in position with a bolt which takes the place of the ordinary inner canula and is constructed practically in the same form. When the plug is to be removed, the bolt is drawn out, and a pull is made on the string which projects from the mouth. Introduction of the plug requires the use of a specially contrived conductor which clasps the upper end of the rod in the plug, and from which it is withdrawn by a tug when the plug has been placed in position.

Introduction of the plugs requires the services of the physician ; but treatment by dilatation with the tubes only is sometimes confided to the patient, who often learns to introduce them much more deftly than the physician can.

The frequency of these manipulations will, of course, depend upon conditions which vary in individual instances and concerning which you must depend upon your individual judgment.

The patient should be taught to introduce the tubes himself, and should be instructed to repeat the process at intervals after withdrawing from professional care, on the same principles with which you give analogous instructions to a patient who has been under your care for stricture of the urethra.

[The patient—seven weeks later—is still breathing comfortably without his canula, and is attending school.]

Dermatology.

PSORIASIS.

CLINICAL LECTURE DELIVERED AT THE COLLEGE OF PHYSICIANS AND SURGEONS,
NEW YORK.

BY GEORGE HENRY FOX, M.D.,

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New York.

GENTLEMEN,—I wish to invite your attention to-day to one of the most striking and beautiful of all the cutaneous diseases. Some of you smile at characterizing an eruption as beautiful, and many outside of the profession would assume to be disgusted at the very thought of bestowing admiration upon an eruption, even though it might present all the delicate hues of a gorgeous sunset ; but I am speaking in sober earnest. There are certain eruptions which for beauty and variety of form and color cannot fail to impress the artistic eye, and, were it not for the idea of discomfort and even disgrace which they usually suggest, such eruptions would be admired even by those who lack the enthusiasm of the earnest student of dermatology.

A case of psoriasis presents to us an eruption in which there are no unsightly tumors, no foul-smelling discharges. The lesions are dry and clean, distributed symmetrically in disks or patches of varying size, or in gracefully-festooned rings or gyri, frosted with silvery scales. If such a pattern could only be transferred from the skin to a roll of wall-paper, it might serve to adorn the finest chamber in a king's palace.

The four cases which I shall bring before you to-day are both alike and unlike ; each presents the characteristic features of the psoriatic eruption, while each one differs in its general appearance from the others.

Our first case is a woman of thirty-two, who shows to us as typical an example of psoriasis as could possibly be imagined. The eruption covers the greater portion of the trunk and extremities, and appears in the form of disks of varying size, covered thickly with silvery or mother-of-pearl-like scales, which fall in considerable quantity as she is disrobed. This patient has suffered for many years from constantly



FIG. 1.—Psoriasis.

recurring attacks, and, although at times she has been almost free from eruption, a few patches have always been present. The most characteristic appearance is seen upon her back (see Fig. 1), where the circular patches are too numerous to be counted, varying in size from that of a pin's head to that of a silver dollar, and near the median line, where a number of these disks have coalesced, causing scaly patches of irregular form. The upper and lower extremities are affected in comparatively slight degree; the elbows and knees, localities which are especially apt to become the seat of the psoriatic eruption, being almost free. The scalp is affected, and the white scales can be readily seen along the frontal margin. The face, palms, and soles present no eruption whatever.

Our second case is a man who presents the disease in a comparatively mild form; the small, scaly drops, looking as though wax or thin mortar had been scattered upon the skin, are seen upon the trunk and extremities, and a few circular patches of larger size show a peculiarity which did not exist in the first case,—*i.e.*, a tendency to heal in the centre, and form narrow scaling rings. This is especially noticeable upon the abdomen and back. Here, upon the side, you will observe that the rings have continued to spread and break up at the margin into isolated patches, forming segments of circles enclosing areas of slightly-brownish skin.

The third case presents a strong contrast with those which you have just seen, the patches being few but very large (see (Fig. 2). These patches, as you will observe by a study of their configuration, are made up of several smaller and confluent disks, and in this case a peculiar tendency to their distribution along the median line is well marked. Again, we note that the elbows are free from eruption, while symmetrical patches are seen upon the arms a short distance above.

Our fourth case is one of very long standing, and presents no scales, owing to the fact that the patient has been recently undergoing treatment. The greater portion of the trunk and extremities is covered by dark-red, infiltrated patches with sharply-defined borders. Upon the back you will find but a few angular islands of healthy skin.

From these cases it is apparent that psoriasis in its typical form is a dry, scaly, and marginate eruption. It may consist of few small, scaly spots, which are almost invariably symmetrical, and most likely to appear upon the extensor aspect of the extremities. On the other hand, it may cover the greater portion of the body. The elbows and knees are commonly spoken of as being the favorite or most common seat of psoriasis, but even in a well-developed case these localities

may be free, as we noticed in our first and third patients. The scalp is very apt to be affected in all cases, and its frontal margin is quite as apt to present the characteristic eruption as are the elbows and knees. The palms and soles in each of the cases which we have seen are free. This will usually be found to be the case. It has been asserted by some that psoriasis never affects the palms and soles. This is not strictly true, however, as occasionally the lesions are found in these localities. In psoriasis of long standing the nails are very apt to suffer, just as they do in eczema and some other chronic affections of the skin. A number of pits or longitudinal striæ will be seen upon the surface of some of the nails; the free margin becomes whitish and friable, and sometimes separated from the bed by an accumulation of epidermic scales. The sensation of itching, complained of by two of our cases, is sometimes present in a marked degree in cases of psoriasis, but, as a rule, the pruritus is by no means so troublesome as in eczema. In a given case it may vary at different times, and depends more upon the condition of the patient than upon the abundance of the eruption.

The patches of psoriasis invariably begin as small red papules, which quickly become covered by thin scales. Such lesions usually increase in size and retain the circular form. This scaly disk may continue to spread indefinitely, but ordinarily the large patches in a case of psoriasis are made up by the confluence of smaller circular lesions. As the disks of psoriasis increase in size, the centre may remain scaly, or may clear up, leaving a scaly ring enclosing a healthy or slightly-pigmented area, as we noted in our second case. Occasionally rings will be formed in psoriasis by the development of small scaly spots in a circle, thus enclosing a central area of healthy skin which has not been the seat of the disease.

The various clinical appearances presented by psoriasis in different cases led the older dermatologists to describe a number of clinical forms, the names of which sometimes tax the memory of students. When many small pin-head lesions are seen upon the body, the eruption is spoken of as *psoriasis punctata*. When small disks abound, as is frequently the case, the name *psoriasis guttata* is applied; when most of the disks are of the size of a silver dollar, and the scales suggest the resemblance to silver coins, we speak of *psoriasis nummulata*; and when large portions of the skin are affected by the confluence of numerous patches, the term *psoriasis diffusa* is employed. *Psoriasis annulata* or *gyrata* is applicable to the rings seen upon the body of our second patient, and in certain chronic cases, where the scales have been allowed to spread and appear almost like plates of armor upon



FIG. 2.—Psoriasis.

the skin, the term *psoriasis inveterata* has been used. When the greater portion of the body is involved, we speak of *psoriasis universalis*. A few rare cases, occurring in patients with a pyogenic tendency, have been reported as *psoriasis rupioides*, owing to the formation of pus beneath the crusts and their consequent elevation. It must be borne in mind that these are not varieties of a disease, but simply peculiar forms which the eruption may present, and it is only necessary to remember these names for convenience of description. Some writers speak of *psoriasis syphilitica* and *non-syphilitica*, but, as a matter of fact, there is no such thing as a syphilitic psoriasis, and it is unfortunate that this term is ever applied to the scaling syphilide.

Psoriasis is very prone to occur in repeated attacks at certain seasons of the year; the first outbreak may have almost or entirely disappeared spontaneously, when the second attack occurs in the following year. As the disease becomes more chronic, the eruption is apt to be more abundant, but it not infrequently disappears for several years at a time. When the patches of psoriasis have disappeared, a pigmentation or staining of the skin is sometimes left for a short time. This is especially apt to be the case when arsenic has been administered in full doses. In rare cases epithelioma has been observed to develop upon the seat of the psoriatic patches.

If a portion of skin be cut from a patch of psoriasis of recent development and sections examined beneath the microscope, the following abnormal conditions may be noted. First, the mucous layer is considerably thickened and extends deeply into the corium between the papillæ, which accordingly appear elongated. Secondly, the horny layer is thickened by the accumulation of dead cells upon the surface of the skin. Thirdly, the blood-vessels in the papillary layer of the corium are dilated and surrounded by inflammatory cell infiltration, which accounts for the elevation of the patches when the scales have been removed. It is supposed by expert observers that the pathological process begins as a hyperplasia of the epithelial cells, and that the inflammation of the corium is secondary to this. Psoriasis is to be considered, therefore, as a hyperkeratosis which leads to inflammation of the skin.

The diagnosis of psoriasis is easily made in the majority of cases. It differs from eczema in the fact that the lesions are invariably dry and marginate in form. The course of the disease will also assist in the diagnosis, if the case be a chronic one. Whereas eczema, no matter how long it has existed, is apt to remain cured when once the eruption has disappeared, psoriasis is almost certain to show itself, in a

mild form at least, year after year. When psoriasis occurs about the genitals, it is apt to present a strong resemblance to eczema, and often puzzles the most expert diagnostician. The papulo-squamous syphilide, erroneously spoken of as psoriasis syphilitica, may present a strong resemblance to ordinary guttate or nummular psoriasis. It is to be noted, however, that in syphilis we always have considerable infiltration of the skin with a slight amount of scaling, whereas in psoriasis the infiltration of the skin is always slight, and the scaling may be abundant. The history of recurring attacks will here again enable us to distinguish between the two. A diagnostic feature which has often been emphasized is the occurrence of a number of bleeding points when the scale from a recent lesion is scratched off, but a bleeding surface can sometimes be developed by forcibly removing the scale in eczema or syphilis, and in many psoriatic lesions tending to recovery this peculiarity cannot be demonstrated. Psoriasis might also be confounded with ringworm, lichen planus, lichen ruber, and other scaly affections; but the experience gained from the careful study of cases will give you the necessary diagnostic acumen, which can never be imparted by lectures or tables of differential diagnosis.

As regards the cause of psoriasis, it may be frankly stated at the outset that we do not know much about it. The proportion of psoriatic cases in private and dispensary practice will range from five to seven per cent. We find the disease occurring at all ages, although it is most common in middle life. The greatest accumulation of scales which I have ever seen occurred in a girl of eight years, and the disease has been noted even in infancy. Occasionally it persists in advanced life, but the majority of our patients are found in youth and middle age. It occurs in either sex with about equal frequency. That the disease is transmitted from one generation to another a very limited clinical experience will usually demonstrate. It is not uncommon for one or two children of a psoriatic father or mother to present the disease, while their brothers and sisters show no tendency to it whatever. A gouty or rheumatic tendency is often associated with psoriasis, but the importance of this as an etiological factor has, I think, been overestimated by many writers. It is a singular fact that the majority of our psoriatic patients are robust and well nourished, and usually quite free from other diseases; but it is also to be noted that, where the psoriatic tendency exists, anything which tends to lower the tone of the patient's system—whether it be pregnancy, lactation, overwork, anxiety, or dissipation—will certainly lead to a fresh outbreak of the eruption. It has recently been asserted that

psoriasis is a parasitic disease, and it is undoubtedly true that micrococci can be found in or beneath the scales taken from psoriatic patches. It has also been stated that by rubbing these scales upon the skin of animals a scaly eruption has been induced; but it seems to me that no one with any considerable amount of clinical experience in the treatment of psoriasis can believe for a moment that the disease is one which pertains to the skin alone. Whether we understand the cause or not, there is certainly some systemic condition which predisposes to the development of this peculiar form of cutaneous inflammation. It appears satisfactory to some to describe this general condition as a dartsous or rheumatic diathesis, but the predisposing cause does not appear to be identical in all cases, and the assumption of a diathesis is simply equivalent to saying that a patient with a psoriatic eruption possesses a psoriatic diathesis or tendency.

A volume might be written on the treatment of psoriasis if all the therapeutic views and suggested remedies were to be discussed, but time will permit of but a brief mention of those which I have found to be of the greatest service. In the first place, the patient himself must be treated as though he had no eruption of the skin whatever, and the general condition improved in every possible manner. This having been accomplished, a given plan of treatment will often prove successful which under other circumstances would be condemned as worthless. In few eruptions of the skin is the question of diet of more importance than in psoriasis, and most contradictory views have been advanced as to the most approved dietetic measures. While some have claimed that an exclusive meat diet will effect a cure of nearly every case of psoriasis, others insist that a fruit and vegetable diet will be productive of much better results. I have certainly found in my own experience that many patients with chronic psoriasis have been greatly benefited by a complete abstinence from nitrogenous food. These patients have noted themselves the fact that on a meat diet the patches have invariably become more inflamed and itchy; but in certain cases, where psoriasis seems dependent in large measure upon faulty digestion, the fact that beef will agree with the stomach when starchy and saccharine food will certainly disagree must be borne in mind. It has always seemed to me that a meat diet is a good deal like the custom of wearing furs. This may be highly advisable in January, but it is not proper for July, and so the upholders of a meat diet at all seasons, on the one hand, and the strict vegetarians, on the other, are both in error. A radical change of diet in psoriasis, as in many inflammatory skin-diseases, is often productive of the most beneficial

results; and, while I have known a beefsteak-and-hot-water diet for a limited period of time to improve digestion and benefit a case of psoriasis in winter, I have known several cases of psoriasis cured by an exclusive bread-and-milk diet in summer.

As regards the drugs which have been recommended in the treatment of this disease, I believe that there are very few which have any direct action upon the eruption. At certain seasons most cases of psoriasis tend to improvement, and whatever remedy is prescribed at this time is likely to gain credit for therapeutic efficacy to which it has no claim. Arsenic has found greater favor than any other drug by virtue of its direct effect upon the skin, and certainly in few affections of the skin is this drug more apt to manifest its therapeutic value than in psoriasis; but for every case of psoriasis which I have seen or known to be cured by arsenic, I have probably seen ten where it has failed to cure and positively done harm. Its indiscriminate use in skin-diseases in general is most reprehensible. In all cases where the skin is in a more or less inflamed state, where the eruption is on the increase, arsenic is very apt to augment the itching and aggravate the eruption. In such cases a judicious dietary combined with alkaline diuretics should be mainly relied upon. The citrate or acetate of potassium, well diluted, and taken a short time before meals, will usually relieve the congestion of the skin. The large doses of iodide of potassium which have been strongly recommended of late in the treatment of psoriasis have failed to cure a number of cases in which I have tried them, and whatever good results are obtained by the use of this drug are due entirely, I believe, to its diuretic action. The wine of antimony or turpentine may prove of value in this stage or condition of the eruption. When, however, the eruption is on the decline, and the disease is tending to get well, arsenic may be given with good effect, in gradually-increasing doses; but even under the long-continued use of this drug the eruption is frequently known to recur.

We now come to the local treatment of psoriasis, which is of the greatest importance after the acute congestion of the skin has been subdued by dietetic treatment and the use of diuretics. In mild cases, where the scaling is slight, simple inunctions following the free use of soap are often all that is required. Salicylic acid, which has a marked effect in softening the horny tissue, may be employed in a mixture of alcohol and castor oil, containing from two to five per cent. of the acid. The ointment of ammoniated mercury is also of service in this form of psoriasis, especially upon the scalp and face, but care must be taken lest salivation occur should it be used over a large

extent of surface. Thymol and naphthol in oil or ointment are also valuable in the mild form of the disease, and do not have the disadvantage of the more efficient remedies of which I shall presently speak.

In the inveterate form of psoriasis, tar has long been and is still an effective agent in removing the scales and restoring the diseased skin to the normal condition. The oil of cade is the preparation which I have found of most service, and, if this is diluted with one-third of alcohol, it can be easily applied to the skin by the patient or his attendant. To secure its best effect it must be *thoroughly rubbed into the skin*.

But the most efficient remedy beyond all doubt which we possess in the local treatment of psoriasis is chrysarobin, provided it is used at the proper stage in the course of the disease. Where the lesions are few, a good form of application is a ten-per-cent. solution of the drug in liquor gutta-perchæ. Where a large extent of surface is to be treated, an ointment varying from five to twenty per cent. in strength may be used. As is well known, chrysarobin has the disadvantage of staining not only the skin, but the underclothing and bed-linen, and sometimes producing an acute dermatitis, or a conjunctivitis if it is brought in contact with the eyes; but no other remedy possesses the same power of quickly removing the scales and the thickening of the skin. It has been noted by many dermatologists that the chrysarobin found in the market at the present day is by no means as effective as that which was used when the drug was first introduced, ten or twelve years ago. I have therefore resorted recently to a lotion of goa powder, from which the chrysarobin is obtained; and the following will be found of service:

R Goa powder, 5 parts;
Carron oil, 100 parts. M.

As to the most recent remedy recommended as of value in the treatment of psoriasis,—aristol,—I can only say that it is of some value, though by no means equal to the claims which are made for it. A five- or ten-per-cent. solution in vaseline removes the scales very rapidly, and will produce a great improvement in many cases.

The prognosis in psoriasis is usually good, so far as the removal of the eruption is concerned; but, inasmuch as little is known of its cause, it is a difficult matter to strike at the root of the disease, and, in spite of our most judicious and successful treatment, the tendency to relapse, which is such a marked characteristic of the affection, is very apt to remain. It is only by judicious treatment of the patient, and not of the eruption alone, that we can hope to effect a radical and permanent cure.

INFANTILE ECZEMA.

CLINICAL LECTURE DELIVERED AT THE ST. LOUIS COLLEGE OF PHYSICIANS
AND SURGEONS.

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THE case which I present to you to-day is one which you will do well to observe closely, as it represents a trouble which you will frequently see. It typifies one of the common phases of infantile eczema, such as is most often found in the children of those who are situated in poor or in rather moderate circumstances. The child before us is a little boy about two years old, whose mother states that he has been suffering from his present trouble for some time, and is growing steadily worse.

As you will observe, he presents lesions which are marked, and which I wish you to notice particularly, as they are almost pathognomonic of the disease, and once learned will always be readily recognized as peculiar to the trouble. You see upon each side of the face, embracing the cheeks and extending upward into the hairy scalp, brownish crusts, having here and there interstices through which a certain amount of exudation takes place. The ears look raw in places. In others there are small crusts, yellowish or brownish in color, and at the posterior and inferior commissures there is exudation and a certain excoriated appearance. If any attempt is made to move the concha of the ear, pain is elicited; and you perceive that the patient occasionally raises one or the other of his hands to the facial lesions, in order to scratch them. Upon attempting to separate a portion of the crust we notice an exudation, consisting of a glairy, mucoid liquid, some blood, and perhaps a minute quantity of muco-pus. The mother informs us that she cannot realize the cause of the trouble, as she has been very careful to wash the child twice daily with lukewarm water and Castile soap, as recommended by a friend. The scalp has always been thoroughly washed, and yet here and there are crusts of different sizes, vary-

ing from that of a dime to a half-dollar, which seem to be increasing. The child is fretful, does not rest well, and its appetite is impaired. Upon inspection the little patient has a pale look, appears badly nourished, and interrogation elicits the fact that the action of his pulse is irregular. Greenish diarrhœas are succeeded by constipation, occasional vomiting occurs, and altogether its gastro-intestinal system seems to be in a bad way.

This is clearly a case of infantile eczema. There is probably no other cutaneous affection occurring in children which simulates the appearance presented by this one. We might have similar lesions due to other processes occurring in older subjects, but, as infantile eczema is confined to children and infants up to the fifth year, there scarcely seems to be a possibility of making a wrong diagnosis. The itching is a confirmatory sign, and the restlessness due to this symptom is also a further proof. The statement of the mother concerning the washing is also of value in forming a diagnosis, as air and water are two of the most important factors in the production of intensity and duration in this disease.

To the intestinal trouble is probably due the occurrence of the eczema and its continuation. It is a common experience to observe teething infants develop eczema, more particularly about the head and face, and there is no doubt in my mind that the gastro-intestinal disturbances incident to the period of dentition have much to do with the genesis of the skin-affection. The question which then naturally suggests itself is whether this is really a cause or not. If so, why is it that so many who suffer from the same general symptoms do not develop eczema? This opens a wide field of speculation to us, and the solution of the problem is found in a recourse to transmitted tendencies. Parents who are rheumatic or gouty or who are prone to acidity of the system are very apt to have children subject to eczema, just as we find that certain neurotic parents have descendants in whom the tendency manifests itself in the form of urticaria, erythema nodosum, etc. To explain the cause of these facts is a difficult matter, and to say that a tendency is acquired is equivalent to saying that we are ignorant of their etiology.

Despite this, however, treatment is eminently successful in such cases as the one we have before us. While it may seem to be very simple, it is none the less efficacious. It is based upon those broad general principles which should guide us in every case; and, while it may be necessary to make slight variations in individual cases, the method remains the same.

In the present case the diet is to be restricted, to a certain extent, so far as its quality is concerned. Plenty of milk to which lime-water is added should be given, supplemented by animal broths preferably, and not much starchy food. To produce a better action of the intestinal function, the following powder is to be given every evening :

R Hydrarg. chlor. mitis, gr. ij ;
Sodæ bicarb., gr. iv. M.

This will produce free evacuations, which will soon assume a more normal appearance. Of course, the bowels are to be carefully watched, but calomel will be found to be one of the best remedies for this purpose. It acts so well that a prominent pediatricist, of Chicago, has stated that it alone was sufficient to cure every case of infantile eczema.

Local treatment, however, is of the highest importance, and it also is of a very simple character. The first and perhaps most important thing to do is to prohibit washing the child. Water has been aptly described as a "poison" to an eczematous skin. If it is found necessary to cleanse, some bland oil should be used, and for this purpose fresh olive, cod, castor, or cotton-seed oil may be employed. In the second place, the crusts must be removed, in order to be able to make applications which will prove efficacious. While starch or bread poultices are very good for this purpose, you cannot trust parents to apply them. They will invariably do the wrong thing, and aggravate the trouble you seek to relieve. A better method, and one unattended with the danger of any untoward effects, is that of soaking the crusts with a bland oil. This causes their rapid separation and leaves a surface to which you may apply your dressings advantageously.

As dressings, bland and mildly-astringent ointments are the best, and should be kept in constant contact with the affected parts. For example, in the present case we will use the following :

R Zinci oxidi, ℥ss ;
Bismuth subnit., ℥jss ;
Adipis benzoati, ℥ij. M.
Sig.—Renew twice daily.

Hebra's diachylon ointment may be used, or a mild tannin ointment with oxide of zinc would do. The point to observe is to keep the dressings constantly in place, for which purpose a cap is absolutely necessary, otherwise the child will remove the applications in its efforts to scratch the lesions.

This form of eczema yields readily to protective and soothing treatment, and after the lesions have disappeared as much care should be taken as before to avoid contact with water. While the lesions look badly, no trouble need be anticipated as to the production of scars. The process is confined to the epidermis, and no permanent deformity ever ensues unless ulcers exist, which will naturally be followed by scars. These, however, do not occur unless caustic applications have been made.

This infant, aged three months, presents a lesion of the scalp that is commonly observed, and which is known popularly as milk-crust (*crusta lactea*). This is one of the commoner phases of infantile eczema frequently observed in those who are the victims of over-washing. Before proceeding to a consideration of the etiology of the trouble, we will notice the objective symptoms which are present in the patient.

As you will see, the child is apparently well nourished, strong and healthy, to all intents and purposes, and is troubled only with the affection of the scalp, which presents itself as a yellowish, rather thick crust, diffused over the upper portion of the skull, having a nearly oval form, and stopping short at the border of the hair anteriorly, at the vertex posteriorly, and a little above each ear laterally. If you attempt to remove a portion of this crust, which is plainly the inspissated remains of some exudation, you will find beneath it a rather raw, exuding surface, painful to the touch, and having inflamed-looking borders. If you observe the child carefully, you will see it raise its little hands to the scalp occasionally, as if endeavoring to scratch, and, when its mother attempts to restrain it from this action, bore its head into her bosom. This is a plain indication of the amount of itching which is present; and, taken in connection with the raw, exuding surface which is presented, and with the character of the crust which we find, the diagnosis is not a difficult matter.

The only cutaneous trouble for which it might be mistaken would be favus, and in this disease the itching is not so marked, and even in old cases we find here and there the characteristic scutula or cups, centrally perforated by hairs. In addition to this, the surface which is exposed by the removal of the crust, if it is at all exudative in appearance, is only so here and there. Moreover, favus possesses that peculiar mouse-nest odor by which alone it might almost be recognized. To make certainty doubly certain, a repeated microscopical examination of the crust will show the presence of mycelia and spores, char-

acteristic of the *achorion Schönleini*, which, of course, is pathognomonic of *tinea favosa*.

The treatment of a case, such as we have under consideration, is to consist rather in the management than in the medication, the latter being very simple in character and efficient in results if the former be properly carried out. Any derangement of the gastric, hepatic, or intestinal functions should be corrected, constipation being removed by the administration of calomel,—about three-quarters of a grain, with some sugar of milk, given in the morning, being sufficient for a case of this character; and, if there be any dyspeptic symptoms present, a little lactopeptine administered after each nursing, by dropping a grain or two upon the tongue of the patient, will correct this derangement of the digestive functions. The character of the stools, as I have already told you, will, to a great extent, govern the proper measure of treatment so far as the correction of intestinal and gastric disorders is concerned.

As to the management, everything which may prove irritating to the affected surface should be carefully avoided, and first among these may be mentioned water. If it is absolutely necessary to cleanse, this should be done at rare intervals, and the water should be prepared in such a manner with alkalis, using a combination of borax and bicarbonate of sodium added to the water, as will make it prove less irritating than if it be used alone. Very little soap should be employed, and this of the most bland character. Any saponaceous compound rich in alkalis should be carefully avoided, and this is a rule which should also be followed in all the applications made to the diseased portion. Anything which is irritating or stimulating should be avoided, as it will only increase the trouble, whereas soothing remedies, such as are protective in character, will be followed by the happiest results.

Before remedies of such a nature can be applied, however, it is necessary to remove in its entirety the crust which covers the affected surface, and, while it is a good plan to use a starch poultice for this purpose, as I have already stated, the improper application of such a method is very apt to aggravate the inflammatory condition which is already present; so that, on the whole, the use of some bland oil or thin ointment is much better. It may take a little more time, but it is not followed by any irritative process or by any aggravation of that which is already present. As a local application lard should be avoided, as it is very apt to become rancid, and the fatty acids which are produced will prove irritants. While cold cream (rose-water ointment) may become rancid in time, it is, as a rule, not prone to this, and

is preferable to petroleum preparations, from the fact that it is firmer and does not have a tendency to run and in that manner expose the surface to which it has been applied to external irritants. I am in the habit of having more wax and spermaceti added to the rose-water ointment, in order to make it stiffer, so that it can be nicely spread upon a cloth, and this cloth applied to the scalp. You will find that this is a much better method of making applications of ointment in cases of eczema of the scalp in infants than that of using lotions or of smearing your ointment without using any external artificial protective. As an ointment which can be recommended in this case, the following is indicated :

R Zinci oxidi, ℥ij;
 Pulv. camphoræ, ℥j;
 Ung. aquæ rosæ, ℥ij. M.

This is spread upon a soft cloth to the thickness of an ordinary knife-blade, placed upon the scalp so as to cover the entire lesion, and over this is applied a light, thin muslin cap, in order that the child may not disturb the dressing by its efforts at scratching. The exclusion of the air and water by means of the ointment will relieve the child of a great deal of irritation, and this relief will be augmented by the action of the camphor which is combined in the salve, and which also has a tendency to diminish the itching.

In cases of this character where the inflammatory process is not very acute, and in which there seems to exist a tendency to assume a subacute form, a little stimulation may be judiciously applied by combining in an ointment of oxide of zinc a little tar, say ten grains to the ounce, or even less if this produces any symptoms of irritation. White precipitate ointment largely diluted is also of use; and in those children who appear to be of a strumous habit, of course, the internal administration of the syrup of iodide of iron is of prime importance, and added to this a small amount of iodine incorporated in the ointment, say from five to ten minims of the tincture to the ounce of excipient, will hasten the process.

I have treated some cases of eczema of the scalp in older children, in whom there also existed tinea tarsi, by a very simple method. Examination showed the entire lymphatic system to be implicated, as evidenced by enlargement and hardening of the lymphatic ganglia. The free administration of cod-liver oil internally and externally to the lesions was followed, in a very short time, by a complete cure so far as the eruption was concerned, and by a marked improvement both in the appearance and condition of the patient. This is an example well

worthy of remembering, as indicating the value of managing the disease by attending to those causes which are determined as being prime factors in bringing about the local cutaneous trouble.

The next case is one which is not so often seen as are the others which I have presented to you, but it is the occasion of much more distress, not only on account of the physical pain which is suffered by the patient, but also on account of the mental disturbance to which it gives rise in the minds of the parents of the child. The child before you is a boy three years old; his parents are in rather well-to-do circumstances, the father being a physician, who has unsuccessfully combated the trouble in his child and has applied to me for assistance.

When I first saw the patient he was covered from head to foot by a crustaceous, exuding eruption, showing here and there islets apparently denuded of cuticle; both his actions and the expression of his face gave evidence of acute suffering. He had lost considerably in weight, and was troubled with diarrhoea. The father had used various local applications having petroleum ointment for a base, but the process, instead of giving way, appeared to spread. The diarrhoea seemed to be persistent, due to mal-assimilation of the food which was given. This was the first point to which attention was called, and the treatment, so far as this was concerned, consisted in feeding the child upon animal broths, milk to which lime-water had been added, and administering after each meal a powder consisting of three grains of sub-nitrate of bismuth combined with twenty drops of essence of pepsin, in order to produce, if possible, a better assimilation of the food which was taken, and which was restricted in quantity and given at regular intervals.

So far as local treatment is concerned, in a generalized case of this kind it is necessary, in the first place, to procure complete protection of all the parts, and, in the next place, to keep all the dressings in position, and for this latter purpose it is absolutely necessary to bandage each limb separately, as well as the trunk, to keep the nates and genitalia protected from the excretions, and the head covered with a cap, the face itself being further protected by a mask. As you will readily understand, a dressing of this kind is not only tedious, but requires more than ordinary skill for its proper application, for unless the bandages be applied in the proper manner you will increase the irritation by permitting folds to form in them, and thus have a mechanical disturbing agency which will render nugatory whatever soothing applications you might desire to make.

As this case was in rather an acute stage, soothing applications were indicated, and those such as would prove permanent, because the dressings could be renewed but once in the twenty-four hours at most. The application consisted of a combination of carbolic acid, zinc oxide, and cold cream, as follows :

R Zinci oxidi, ℥j;
Acid. carbolici, ℥ss;
Ung. aquæ rosæ, ℥ij. M.

This was to be applied more especially to the extremities and scalp. For the face and trunk, camphor was substituted for the carbolic acid in double the quantity, as it would scarcely be safe to apply so much carbolic acid over the entire surface of the body, on account of possible intoxication.

As you see, from present appearances, the child has progressed very nicely. Water has been interdicted, of course, and the surface of the skin has been cleansed by means of a bland oil; the intestinal trouble has been corrected, and, on account of its generally depressed condition, some iron will now be ordered, in the form of dialyzed iron, in the dose of ten drops during meals, being best added to broth. Some solid animal food can now be permitted, but starches should still be avoided for some time, and all articles such as jellies, fruits, pie, cakes, etc., be strictly prohibited. The same ointments can be continued, and should be continued, unless certain portions begin to show stubbornness and refuse to give way. Then mildly stimulating ointments would find a proper place; or, in a case of this kind, what perhaps might be better would be the application of liquor picis alkalinus diluted with about six times its amount of water. This preparation is made as follows :

R Picis liquidæ, ℥ij;
Potassæ caustic., ℥j;
Aquæ, ℥v. M.

This preparation acts as a stimulant (the strength of the stimulation, of course, depending upon the dilution), and at the same time is an antipruritic.

Of course, this is not sufficient for the external treatment of a disease of this character. It is absolutely necessary to combine some local, permanent preparation, and for this purpose one of the ointments I have indicated might be sufficient, or you might use gelatin

preparations such as have been suggested by Pick, made by dissolving ordinary gelatin in water, as is done in the preparation of jellies, and adding to this base any of those remedies which have been mentioned, in the proportions named. To apply this remedy, you should gently heat the mass in a water-bath until it becomes liquid, paint it on with a brush, and allow it to dry. You get in this manner a permanent, dry dressing; but care should always be taken that it be applied only to those portions in which there is not much exudation, otherwise the exudation will dissolve your dressing, and the result will be completely negative. In those portions, however, which are dry, you will find that this is a very excellent form of making applications.

If you examine a case of this kind, the flexures of the joints will generally be found to be more deeply affected than other places, because in these localities the skin is thinner. That is the reason also that you find the integument of the infant and child apparently much more deeply implicated than that of the adult, as its skin is delicate, the epidermis is easily removed, and the underlying layers of the skin become exposed to irritating influences. On this account, the dressings which are placed about the flexures of the joints should be particularly soothing, and it is best here to use dressings and gauze bandages, as being more soft and permitting flexion to take place more easily than the muslin and ordinary roller bandages.

The parts about the nates and genitalia easily become irritated from defecation and urination, especially if the child wears a diaper, or if the excreta be allowed to remain in contact with the skin for any length of time. It is for this reason that a particular dressing should be applied in these localities, and probably among the best is one similar to that which is used about the joints, with the addition of absorbent cotton thickly placed outside, so that when it is necessary to remove this dressing, the absorbent cotton is at hand to cleanse the skin in a manner which will not prove so irritating as towels and other similar means. It is also on account of this possibility of irritation that the dressing about this portion should be independent of the other dressings, so that it can be renewed as often as may be necessary without disturbing them, in which the renewal need not be accomplished more than once in twenty-four hours.

The scalp is to be dressed in the same manner as I have indicated in describing the case of crusta lactea. The dressing for the face is one which requires a little attention also, in order to be properly applied, and consists essentially of the following: Get a piece of canton flannel, cut it to about the shape of the face, leave holes for the eyes,

nostrils, and mouth, see that it fits well when applied, make a triangular hole in order to permit the nose to go through, and then apply your remedy upon the hairy side of the cloth. The remedy, of course, should be an ointment, spread over to about the thickness of a knife-blade, and carefully applied to the face by gently pressing down every portion to the integument. In order to hold this mask in position, it will be necessary to have two strings on each side, which are tied behind the head. The sensation of relief will be so grateful to the patient that he will make little or no effort at scratching, and in that manner will not accomplish the removal of the dressing, which should be permanent, more especially at night, when the patient is supposed to sleep. And the patient will sleep if this dressing contains some anodyne, as the others do; and, instead of having the fretting and disturbance continually going on, and only interrupted by short periods of sleep, you will have the child falling into a natural slumber which will last for several hours at a time. You will find that the formation of crusts all over the body will gradually diminish in number, kind, and thickness; that the excoriated portions of the integument will once more regain their normal appearance, and in a comparatively short time the whole skin will once more look natural. While it may have a reddish hue, due to the inflammatory condition which has been present, it will not be long before it regains its color.

And here the management is no less important than it has been in the treatment of the eczema. It is just as important to see that the skin is protected from irritants and that the general condition is kept at par as it was to medicate for the diseased process; for, unless this care be taken, relapses are very apt to take place, as those in whom eczema occurs, more especially children, are very prone to the disease, and those irritating influences which have brought it into being at one time will bring it into being again. These are the cases which, after leaving the hands of the special practitioner, should engage the attention and care of the general practitioner, so far as the prevention or prophylaxis of the disease is concerned. Mothers should be carefully warned against improper food, overfeeding; against the abuse of water, and, if necessary, water should be entirely prohibited for a continued period of time,—until the integument of the child has assumed that normal appearance and resistance absolutely necessary to insure it against any future attacks of its cutaneous trouble. While baths are not to be strictly prohibited, they should be carefully given and always be alkaline; and it is better to add some mucilaginous substance, such as boiled starch, to make them more bland.

XANTHOMA; LICHEN PLANUS; CONGENITAL ALOPECIA; SYPHILITIC TUBERCLE.

CLINICAL LECTURE DELIVERED AT THE RUSH MEDICAL COLLEGE, CHICAGO.

BY JAMES NEVINS HYDE, A.M., M.D.,

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XANTHOMA.

GENTLEMEN,—The male patient before you, twenty-five years of age, tells us that he has been and is in general good health, and was free from cutaneous disease before he first noticed, some six or seven years ago, the peculiar disks that you can see over the points of the elbows, the knees, and the eyelids. These have a fairly accurate symmetrical distribution, and are firm, circular and ovoid, well-defined plaques, having a lighter and darker yellow-leather color, and well embedded in the substance of the integument. The long axes of the disks on the limbs are from four to five centimetres in length, and the rim of each is raised several millimetres from the plane of the adjacent skin, this elevation being properly described as a rim or raised border, seeing that the centre of each disk is notably a flattened infiltrated cushion-like area. Examined more carefully, these circumvallations are seen to be made up of a series of raised and flattish tubercles, whose fusion has produced the effect of a coarse frill surrounding each plaque. There are three or four of these large disks encircling each olecranon; and but one, somewhat larger in size than the former, near the patella of each knee. The lesions on the upper lids, near the inner canthus of each eye, one for each side, are merely flat, split-pea sized, well-defined, softish, oval infiltrated patches, having a lighter shade of yellow than the elbow disks, while these last are markedly lighter in color than those on the lower limbs.

These are interesting examples of the multiple form of xanthoma (xanthoma tuberosum it is denominated when the elementary lesions

are of the size of tubercles), occurring in its rarer situations. Xanthoma of the eyelids, precisely where you see the plane lesions in this patient, is by no means very uncommon in dark-skinned patients of adult years, and rather more often observed in women prone to display dark circles surrounding the orbits. You have doubtless noticed that each hand of this patient is bandaged. These are the dressings of healthy wounds left where a xanthomatous disk or, better, tubercle has been removed from a point over the third metacarpo-phalangeal articulation of each hand. These, before excision, were as large as butternuts, were pathologically identical with the plaques you now see, and were removed at his urgent request because he thought that they decidedly interfered with his manual labor. There was one upon each hand; and they differed chiefly from those you see, in being more elevated and of a decidedly pinkish rather than of a lemon-yellow shade. Other rare situations of these lesions are the buttocks and the anus. A banker of this city lately consulted me for an extensive plane form of the malady affecting the palms of both hands.

This patient first came to me with this trouble four years ago, and now returns because of the slow but gradual increase of the disorder. That which is most conspicuous in his present condition, as compared with the past which I recall, is not so much the increase in the size of the disks, as the darkening of the shade of color, the dull "wash-leather" appearance of the knee-patches being several degrees darker than before.

Examined microscopically in section, these lesions are found to be constituted of rather firm connective tissue, with cellular masses arranged in whorls or nests in the corium; on the whole, somewhat suggestive of the similar collections seen in an epithelioma. But here there is to be seen in and between the cells, not merely masses of yellow pigment, in part responsible for the color of the mass, but also fatty changes in the cells themselves, often described under the phrase "fatty degeneration," though I do not believe that the expression is properly used in this connection. Certainly the process by which the fatty masses are here formed differs in a marked degree from that recognized in what we elsewhere observe in fatty metamorphosis. The micrococci described by authors as effective in the production of these changes have never, I believe, been demonstrated after culture experiments to be capable of inducing the disease, and the etiology of the singular condition is hence by no means as yet clearly understood. Though not strictly the result of heredity, it is often seen in generations of one family, and, as a matter of fact, the mother of this

patient, examined by me four years ago, had slight but well-marked eyelid xanthoma. In some instances the disorder is associated with chronic jaundice, and that whether the icterus be symptomatic of one or another hepatic disease. There are authors who strive to make a distinction between the forms we have been discussing and those occurring in diabetic patients, the grounds for which may yet be established, though at present they are not satisfactory. It is claimed, for example, that the eyelid plane lesions are not seen in the diabetic, yet such a patient was lately sent me by Dr. Purdy of this city. In another case, to which I believe I have alluded before in public, a middle-aged woman with a circle of plane lesions extensively clustered about the inner angles of each orbit, had deluged her face with a strong solution of corrosive sublimate intended for the destruction of parasites, the contents of the bottle having been spilled when both arms were raised above the upturned face for the purpose of reaching a high shelf in a dark closet. Life was saved only after prolonged effort, much of the liquid having been swallowed; and the xanthoma appeared in a year.

After operating on these plaques by the aid of the galvanic current and needle, and by the soft soap and stimulating unguents often advised, I can say that the results have always been unsatisfactory in my hands. Excision, due care being taken when operating upon the lids to avoid subsequent ectropion and epiphora, is alone to be trusted.

LICHEN PLANUS.

Our next patient is a fairly well nourished female child, eight years old, who has been suffering, as her mother informs us, for several months from an itching disease of the skin, occurring first in "spots" on the forearms, and extending later slightly over the trunk, and rather more abundantly over the lower limbs, especially about and below the knees. The disease is gradually disappearing under the treatment properly employed by her physician, who has brought her to us, and who recognized the nature of the malady. Fortunately the essential lesions of the disease can be perfectly recognized, even though the general process is gradually terminating.

Upon the flexor aspect of each forearm, slightly also near the root of the neck, appear the elementary papules of lichen planus, a cutaneous disorder once rarely recognized in America; now, if I am not in error, both more frequently recognized and more frequent of occurrence. In my personal experience, these cases are much more commonly seen in private than in public practice; and I will therefore

ask every student present in turn to examine this arm by the aid of this glass.

Looking with special care at the affected part of the integument, you see that this longitudinal stripe of redness along the anterior aspect of the arm is made up of numerous discrete papules, of a type seen in no other disease of the skin. They are the smallest of all papules,—smaller than those seen in eczema, syphilis, or acne. The smallest are pin-point sized (though not to be seen in this case, in others these papules may increase to the largest size); and however minute, one can always recognize in each the characteristics of all. The apex is flattened or even depressed, the so-called papular “umbilication;” and the outlines of the plane, or slightly-concave top, are polygonal, the daintily-projecting points of each angle being always discernible when the lesions are in the condition you have before your eyes. Many are capped with a fine adherent scale, and this produces a certain silvery sheen upon the arm, which you can determine better without the aid of the glass, looking at the surface, for example, at a distance of two or three feet with the light falling obliquely upon the skin. Coalescence of papules like these and of the larger type (“obtuse,” of Unna) may form patches lying along the lines of distribution of the cutaneous nerves, or produce circles, necklace-like loops, ridges, or crests covered with an adherent and prominent comb like that of a cock (more often in these forms on the lower limbs), the picture being often an eccentric arrangement of circles, patches, and ridges. They take on, after full evolution is accomplished, a characteristic dark pigmentation, involving both patch and periphery, purplish, chocolate-colored, and even blackish. Word was lately brought me of a woman having lichen planus with rather extensive involvement of the skin, that she was “turning black.” The disease may be symmetrical and general, or quite different; it may be expressed in a single group of papules on the back of one hand, over the flexor aspect of one arm, near the flexure of one knee, or on one side of the penis. The itching may be slight or intolerably severe. In this country, the eruption may be well-nigh general, and yet scarcely depart in type from that exhibited in this little patient.

We have not time here to discuss the question, now warmly contested on both sides of the Atlantic, as to the identity or non-identity of lichen planus and lichen ruber. The latter view is that chiefly entertained in this country; the former, almost without a dissenting voice, by the dermatologists of Europe. Our colleagues across the ocean claim that what is called by us “lichen ruber” is not the rare

disease first described in its exaggerated and fatal phase by the elder Hebra, but merely a form of what is called in France pityriasis pilaris, originally described by Devergie, and now chiefly interesting by reason of the contributions to the subject made by living French dermatologists of repute. The lichen ruber acuminatus of the elder Hebra is a disease characterized by the appearance of minute pointed (not flat-topped) papules, giving the sensation of a nutmeg-grater to the finger passed over the surface, gradually extending till the skin is extensively infiltrated and the seat of scaling, the nail-beds and nails becoming affected, exhaustion and marasmus following, and death closing the scene. Hebra, had he lived, would unquestionably with a larger experience have given us a less gloomy picture of his lichen ruber, as seen in Austria, the picture indeed which some of his German confrères give us to-day; yet lichen ruber exactly as he described it is (rarely, it is true) observed in America, one fatal case having fallen under my observation where the patient, after extensive scaling and infiltration of the skin following the appearance of the papules, acquired an icteroid hue and died with a low form of fever. Everything said and done, however,—even admitting that the papules of the plane form in section under the microscope seem to be hyperkeratoses of the deeper rete, while the ruber lesions show inflammatory changes in the corium near the hair-pouches, with knob-like expansions from the outer layers of the sac,—admitting all this, we cannot refuse the evidence, which is daily accumulating in Europe, as to the identity of the two forms. Again and again patients with characteristic lesions of both lichen planus and lichen ruber on the person, have been observed, and these with both successive and simultaneous evolution of the separate lesions. Testimony of this kind from the most trustworthy of observers should satisfy the most cautious. It is to be noted, however, and I think that this is an interesting point to remember, that Europeans (Englishmen excepted) do not describe lichen planus with the exactness of the writers of Anglo-Saxon descent. The disease, as it is seen in Great Britain and America, is scarcely known on the Continent; and I have lately remarked with curiosity that one of the papers devoted to this subject by even so careful an observer as Unna, fails to present the vivid portrait of the minute plane lesions now exposed to your eyes.

It may be of more interest to you, from the practical point of view, to add that I am more and more impressed with the belief that many of the cases described as "leucoplakia buccalis," "leukoma," "psoriasis linguæ," "smokers' patches," and by other terms, occurring

in non-syphilitic patients, and even in those who have never used tobacco, are examples of lichen planus of the mouth. *Many*, I say; not all. Here we have to admit that the mucous patches of syphilis may take on queer appearances at times; and that rarely, fortunately very rarely, an epithelioma of the mouth may result. You have all, I take it, seen the changes to which I refer,—whitish streaks, striæ, lines, bands, or patches on the dorsum or sides of the tongue, along the lines indicated by the contact of the teeth of the two jaws on the inside of the cheek, in the sulcus between gum and inner cheek, etc.

In my observation of the lichen planus of America and England, the disease, even when becoming well-nigh generalized, always proceeds to complete recovery under the use of arsenic; and relapses are decided exceptions to the rule, though they do occur. The local treatment is briefly that of an eczema, soothing applications being useful when the skin is greatly irritated; antipruritics (menthol, salicylic and carbolic acids) being required when the itching is severe, and more stimulating applications (tar, naphthol, chrysophanic and pyrogalllic acids) for indolent cases. If the skin tolerates the disease fairly and does not resent its changes, I confess that I lay less and less stress on the local treatment and rely more upon the arsenic, and upon special attention to that condition of overwork, overstrain, brain and cord neurasthenia, which we can so often discover as the remote cause of the mischief.

CONGENITAL ALOPECIA.

Our next patient is also a girl, six and one-half years old, brought to the clinic by her father from the country as an example of a disorder from which two other of his six children are equally suffering, the two patients not brought hither being a younger boy and girl. The child before us is well nourished, and has the brown cheeks of a healthy little country lass. She and her younger brother and sister are reported to have never had any more hair on the scalp than that which you can now see for yourselves; and yet the three unaffected children are said to be well provided with a normal piliary growth. We note also that in the birth of these children no order is observed as to those having and those not having hair in abundance on the scalp. There is no record of this anomaly known in the family of either father or mother. The father, as you see, is a stout, healthy-looking farmer.

You observe the eyelashes and hairs of the eyebrows, and the teeth and nails, are normal in the case of our little patient, but that the entire scalp is covered with a uniformly thin growth of whitish,

fine downy hairs scarcely more than two centimetres in length. These are, as you see, so readily removed with the epilating forceps that the child is not apparently conscious of their plucking. The surface of the scalp is quite normal, exhibiting no traces of any disease whatever, nor is there any patch of complete alopecia in any part. It is simply uniformly and symmetrically covered with this exceedingly thin, fine, piliary growth, with each hair so slightly attached to its hair-pouch that the filaments can be removed by brisk friction.

This is one of those rare cases of congenital alopecia, examples of which have been during the last five years shown in this clinic but two or three times. One of these cases was that of a child two years old with a scalp exhibiting the "billiard-ball" smoothness of alopecia areata, a long whitish lock, however, growing luxuriantly from one side of the vertex. In that case there was, we thought, a congenital absence of hair-follicles over the greater part of the scalp.

We shall order for these patients a stimulating shampoo of green soap, to be followed by a salicylated lanolin ointment; and this with but very little hope of accomplishing anything in the way of promoting a natural growth of hair. A congenitally inactive hair-follicle is often in a more hopeless condition than a hair-follicle that shows obstinate inactivity after the middle period of life is reached. The two may be whipped into a temporary activity; but, as a rule, the results do not at all compare with the brilliant reward obtained by the skillful management of either early syphilitic alopecia or one of the forms of alopecia areata in childhood.

SYPHILITIC TUBERCLE.

Our last patient for to-day is a man nearly twenty-seven years old, unmarried, well nourished, and a laborer, who shows us, as the sole eruptive symptoms upon his skin, a circular patch of a dull red color over his left eyebrow, and two groups of a slightly different aspect on the outer side of the calf of the left leg. The appearances here are so characteristic that we can make an accurate diagnosis without asking him questions, a procedure not advisable in private practice, but one from which a great deal may often be learned when training oneself in public practice; for he who has learned how to avoid errors is a good way advanced towards the truth.

The elementary lesion of all these groups is larger than a split pea; it is of the size we call "tubercle," and is well developed, well embedded in the skin, and yet noticeably projecting from the general level of the latter, with rounded top, and colored in shades of a rather

dirty yellowish and reddish brown, the "raw-ham" color of Swediaur and others. The circlet is nearly perfect on the forehead and about half a finger's length in diameter, with a little raised wall about it made up of rather closely packed tubercles, enclosing the central, flattish disk of infiltration, constituted of tubercles that have apparently undergone partial resolution, and left this central part like a firm cushion with a shade of color rather lighter than that of the surrounding wall.

The tubercles on the left leg are clustered in two groups, and the elements of each group are not so fused as over the brow. Here the lesions are more distinct and isolated; the wall they form resembles one constructed rather of regularly disposed heaps of the material employed than of an uninterrupted circular embankment. Note that neither here upon the leg, nor on the brow, are there traces of pus, or dried pus in the form of crusts, or vesiculation, or any other morbid sign save those that I have named, with the single exception of the centre of one of these circular groups on the leg. This exceptional centre is a characteristic scar. It lies within the encompassing border of our material heaped up in the shape of isolated tubercles; and is smooth, circular, pliable, not deeply attached to the subcutaneous tissue, and has evidently been darkly colored once, for its pigmentation is fading in a centrifugal direction, the centre of the scar being almost of a dead whitish hue, the outer flange being a dirty chocolate brown. The second group of tubercles on this leg, that nearer the tibial crest, has for its centre not a scar, but a flattened disk like that studied on the brow.

Now this is a not uncommon picture of tertiary or late (not very late) syphilis, the tubercles being syphilitic tubercles, and the infiltration being a syphilitic infiltration of the gummatous type, while the scar is in all points characteristic of syphilis. We make a positive diagnosis of lues in this case without making inquiries of the patient, because (and I wish to call the attention of every one present to this solid fact) no other disease at present known to us ever furnishes us with the exact picture you now have before you. The three patches tell the whole story, absolutely all that we require to know in order to diagnosticate the disease and relieve the patient of his trouble. This is a matter of practical importance. Your next patient may be a woman of such unquestioned character and position that it will be a matter of offence if you inquire whether she has ever had syphilis. Such a question would be, in such a case, both impertinent and unnecessary. I believe with Mr. Hutchinson, of London, that it is rarely, very

rarely, needful to ask a woman whether she has had such a disease; and let me add that her answers to such a question in nearly eighty per cent. of responses (this is probably below rather than above the exact figures) would be absolutely worthless to the diagnostician, and that whether such answers were in the affirmative or negative. Every competent medical man should know more on such a point, after making a physical examination, than any woman wholly ignorant of the facts. It is simply astounding to find so many women passing through the early periods of syphilis without knowing of their infection. They are the innocent victims, as a rule, of a husband's infidelity. His progenital region is examined with ease and his discovery of a chancre there is often prompt and followed by an appeal to medical skill. *Her* chancre is often hidden from her eyes. If occurring in the vagina, an eminent French writer declares that not only she herself, but even the best of her physicians, may fail to recognize it. What is true of the chancre is true of the indolently appearing cutaneous phenomena of early general syphilis. She presents, after a few years of ignorance as to infection, just such a picture as is now before our eyes. This man with an unexplored history is to us, for our present purpose, in the position of a woman with a history that we are forbidden to explore. He has been infected with his disease, not this year nor last, but probably between four and eight years ago. We will say four at a venture. We will not say three, because his general vigor is good and he has not that cachexia (due either to the malady itself, or to chronic alcoholism, or to debauchery) which furnishes us with a precocious development of tubercles in syphilis. Also, the scar tissue on his leg is decolorized for about two-thirds of its expanse. This is a slow process, particularly when watched upon the leg, since the vascular pressure there is greater than on the brow, and the weight of the blood column has an enormous influence on the color of skin symptoms in the leg, whether due to syphilis, eczema, lepra, or psoriasis. Now, tubercles in syphilis may form in an ordinarily sound patient between the third and tenth year, and when in few groups are commonly later than when in many groups or in a general efflorescence. Hence we conclude loosely that the infection occurred between four and six years ago; and for the purpose of a guess we have put it at four years.

(The patient then, in response to a question, admitted infection "about five years" before the date of examination.)

If this patient were a woman (and you have often heard this corroborative evidence adduced in this clinic), we should now proceed to ask

her as to the products of conception, since such patients are most often married women. If she has had children, we ask how many are living, how many dead, at what ages those that died perished, and of what diseases. We also inquire as to all miscarriages and still-births. Often we get a history of a miscarriage or still-birth at about the period we have assigned for her infection; then the story of a child dead-born or surviving but for a day; then a child dead of some disease at the second or third month; then possibly of a surviving infant: all this, too, practically made clear by inspecting with some care two or three patches of a diseased skin, looking like and often long treated for a "ringworm," or for "salt rheum," or for any other disease called by a name not unfamiliar to the common understanding.

Returning to our patient, let me say that tubercles of this middle rather than late stage of syphilis may be of the resolute type seen here, or may break down and form one or many ulcers, at first superficial, later deep. The scar they leave is in both forms curiously similar. That is, when the tubercle is "resolving," either under the influence of medication or of the natural recuperative power of the individual (no one can, I feel sure, deny the force of this last agency), its gummatous material has actually replaced and displaced the normal elements of the corium, and the wasted atrophic patch left is a scar scarcely differing from that which is left after the healing of a true syphilitic ulcer. You have before you a scar exhibiting all the true features of the syphilitic type,—circularity, thinness, delicacy, non-adherence to deep tissue, pigmentation, and decolorization in course of time from the centre towards the periphery. Often the centre of these patches, or, better, the area within the surrounding wall, is made of groups of these atrophic disks, circular, wafer-sized, separated by a network of ridges formed of half-resolved tubercles, some covered with a thin, dirty-looking scale, some smooth and pigmented, some bleaching centrally, occasionally ulcerated and crusted. Many of these groups persist for years at a time, the process steadily invading the skin by the formation of new walls, each farther and farther removed from the centre, the old wall flattening, "resolving," and forming its part of a new outer rim for a larger enclosure, infiltrated, scaling, cushiony, scar-like, ulcerated, or crusting. In this way patients will sometimes show you an entire limb or the whole buttock invaded, the innermost portion of the "giant" circle suggesting that the superficial skin had been injured by some such odd process as the engravers use in "stippling" or otherwise grooving their metal plate. The wall may then stretch over several feet of the integument, following its circular trend

as well as may be, here interrupted by the flexures of a joint, there pushing on without hinderance or obstacle. Meantime (note it well!) no other sign of syphilis may be detected. The patient may enjoy very fair health as to the general condition. He or she pursues the ordinary tenor of life, discharging all of its duties and even accomplishing a large success in many of its higher spheres. If the patches disfigure the face, there is often a resort to the curative expedients of those uninstructed as to their condition, the swallowing of proprietary medicines, the taking of the several remedies advised by friends, the trial of the "sovereign salves" of which they hear. The patches are often called "scrofulous ringworm," "lupus," or names derived from diseases of the lower animals, from which it is often thought to be communicated. But it is always a pure syphiloderm, never to be confounded with any other disease, and well worth the careful study of every man in the general practice of medicine.

If you will keep the minute details of this picture in mind, you need rarely have difficulty in establishing a diagnosis in any doubtful case. Lupus vulgaris of the face, in nearly fifty per cent. of cases, begins before the second decade of life, and in at least eighty per cent. before puberty. Syphilis is in general a disease of the post-puberal epoch; and its tubercular symptoms in the skin are preceded, as we have seen, by several years of systemic invasion. However tedious may be the cyclical career of the syphiloderm, it is rapidity itself compared with that of the nodule of lupus (softish, tinted in a lighter shade, scaling) which I have seen persisting after a quarter of a century without conspicuous modification. Lupus vulgaris (if you prefer the term, "tuberculosis of the skin") is almost never general, rarely multiple (displayed, for example, over the face and limbs at the same time in one person); while it is seldom that there is but one patch of tubercular syphilis on the skin of one person. The lupoid ulcer is highly irregular in its contour; that of syphilis is circular or oval; the edge of the former is thin and purplish, and its ridged, uneven, puckered, and deforming scar contrasts with the symmetrical smoothness and mica-like thinness of the atrophic centre of a group of syphilitic tubercles. Psoriasis, too, is a disease largely of early life, and its circlets are crowned with large lustrous scales never encircling as a border, an ulcer, a scar, or an irregularly "stippled" area. Ringworm never implicates more than the superficial layers of the epidermis; never persists for years; never ulcerates; never leaves a scar. The microscope always reveals its cause in the trichophyton.

The treatment of the syphiloderm as it is here presented to our

observation is simple. Locally we stimulate the absorptive processes by using hot water, with soap, making the water quite as hot as is tolerable and the soap effective by applying it in alcoholic solution (e.g., the tincture of green soap of the U. S. Pharmacopœia). After this, the patch is dried and a salve of mercury, or tar, or both, applied, with or without securing constant contact by spreading the latter on a bit of muslin and keeping it *in situ*. Much more important is the internal medication. The "mixed" treatment is the best, and I prefer mercurial inunctions with the iodine salts by the stomach. Our routine practice here in the clinic is to give a saturated solution of the iodides of potassium and sodium in milk, after or before meals, and also at night when the case is urgent. We use a few drops of this solution at first, and we increase by one drop daily, not one drop each dose, till our work is done, regarding rather this point than the size of the dose. Our obliteration of these patches is secured with one patient when taking not more than sixty drops daily; in another, when taking a hundred and sixty; but these larger doses are very rarely required. The mercurial inunction is of great service, not over the site of the lesions, but elsewhere; as, for example, over the loins when these are not affected, or on the soles of the feet. The administration of the larger doses of the iodides internally is a measure employed chiefly by Americans, and the results contrast brilliantly with the slower processes of the Germans, who often rely solely in these cases upon the inunction or hypodermic injection of mercury.

I lately saw, for example, in Vienna cases of this kind resisting weeks of the *Einreibungscur*, which would have been, I feel sure, brought to speedier termination by our American methods.

Lastly, in all these obstinate cases of the syphilodermata, never forget that there is often a dyscrasia due solely to the long-continued action upon the system of an infective, probably bacillary, disease. Iron, cod-liver oil, massage, fresh air, salt bathing, a nutritious diet, change of scene,—these are the expedients of the man who plucks his success out of the thorns of difficulties which have discouraged others.

Ophthalmology.

ASTIGMATISM: A VERY COMMON AND OFTEN UNRECOGNIZED CAUSE OF HEADACHE.

CLINICAL LECTURE DELIVERED AT THE UNIVERSITY OF MARYLAND HOSPITAL.

BY JULIAN J. CHISOLM, M.D.,

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GENTLEMEN,—The class of cases which I bring before you this morning are of the deepest interest because they are very frequently met with in every-day practice and are so seldom understood by physicians. These are healthy people, young, active, and industrious. They all suffer more or less with eye-pains and headaches which they call neuralgia, a term which they have learned from their family physician. They have all sought medical advice more than once for these headaches.

The first to whom I will call your attention is a theological student, whose advancement is much interfered with by these head-discomforts. He says that they cause pain in the eyes, and compel him to close his books long before the assigned task has been completed. On this account his life is a continual fret. Mentally he is worried over the gloomy prospects confronting him in securing his education. He cannot work as he would because his head is not right, and his eyes pain him even after a few minutes' application. They burn, become injected, and the edges of the lids are always a little crusty. He is twenty-four years of age. He has by dint of indomitable will-power and by the assistance of friends worked his way through college, and is now balked in his further desire to secure a profession by his inability to study.

The second case is that of a woman thirty years of age. Sewing is her occupation. To earn a living she must ply the needle from early morn till late at night. She is rarely free from headache. She always goes to bed with it, and finds it her companion when she gets

up in the morning. During her school-days she was also annoyed with headaches. Rest of a few days from school and the taking of some medicine which her physician gave her would usually give her temporary relief. Now her work and her head-troubles are constant. Her sedentary occupation has disturbed her digestive system, and she also has some little irregularity in her menses. These disturbances have attracted her attention, and have been brought to the notice of her family medical adviser. In her anxiety to be rid of headaches during the past ten years she has consulted many doctors. These headaches are so severe at times as to put her to bed and make her lose a whole day's work, which she can ill afford to do. By some of her physicians she was told that she had womb-disease, and that the uterine irregularity was the cause of the whole trouble. Once that unfortunate phrase is used to the average woman, it is never forgotten; hence it is a very potent item in the trading stock of some medical men. For the balance of her days or until these physicians tell her that she is cured, the bane of her life is the thought that she has womb-disease. At the hands of some physicians she has sought relief for her headaches through uterine applications. During these many years of more or less constant ailing, the stomach, the liver, and the kidneys have not escaped assaults. Each of these healthy organs in turn has been thoroughly dosed. She has never been very sick except on some occasions when the medicines prescribed were more powerful than her strength could resist. She would then be forced for a few days to keep her bed. Under these conditions of rest and idleness she always found relief from the severity of the headache. Not knowing any better, she would accept the statement of her physician that the temporary improvement was due to the active medicines which she had taken. When rest brought back a little strength and she resumed her sewing, the eye- and head-pains would return in their former intensity. Because the head would hurt first and then her eyes would burn and ache also, she always had believed that the neuralgia of the head caused the eyes to hurt her. She had often been told so by her physicians and had accepted this cause and sequel as a fact. She has come to the eye-clinic because recently she has not seen so well as formerly, and therefore thinks that she needs glasses. Badly as she gets along during the day, by gas-light she cannot work at all. Her eyes burn so much when the gas is lighted that she must keep her back to it to avoid the glare. She goes to bed early, in a bad humor with herself, because headache and eye-pains prevent her from working.

The third case is a school-girl fourteen years of age. At school

she does not see the figures on the black-board from her accustomed seat. She also complains often of headache and of a drawing sensation in her eyes when she reads. Saturdays and Sundays are the only days that her head feels comfortable. Her eyes are often red, with a slight disposition to stick together in the morning. She has been treated for granular lids, but has obtained no permanent relief. Her parents have noticed that when she has a holiday there are no complaints. In the summer months, when there is no school, she can romp with the children, no headache annoying her. As soon as school begins her complaints begin also. Her parents and teachers have attributed this to indisposition to work, and to the absence of all ambition, her headaches having been considered a subterfuge to escape the drudgery of study. She is a stout, healthy girl. She eats heartily and sleeps soundly. She has no digestive troubles, nor uterine irregularities, for her menses have not yet appeared. She seems in every way well except for these frequent headaches and weakness of vision for distant objects. For the headaches the family physician has been consulted on more than one occasion. He has suggested that tardiness of the menstrual flow may be the probable cause of the trouble. He has allayed the anxieties of the mother by the statement that when the menstrual secretion is regularly established these annoyances will all pass away. "Time will surely cure it, and it will all be right, only be patient. At any time the monthlies may show themselves, and then there will be no more headache." The mother has hinted that it must be a family failing, because her son, away from home, writes that he can do no eye-work at night. He also has eye-pains and a drawing sensation at the root of the nose, with a sense of constriction in the temple when he reads for any length of time.

I have purposely selected these cases for your careful study because they are representatives of a very large class of persons, male and female, adults and children, who suffer from headaches. This head-disturbance comes not because of bodily ailments. Every organ except the eyes works smoothly. These persons are not sick unless the physician makes them so. They simply strain their eye-muscles in seeing, and when this is continued for a length of time it causes pain in the head and in other parts of the body. Most of these patients can say that they see well. "There is no trouble with my sight. I can see as far as anybody and can read the finest print. When I read for any length of time, my head hurts me and then my eyes pain. The eyes burn and get red. They feel so gritty and uncomfortable that I have to desist from work, and it is hours before I get rid of the dis-

comfort. A good night's rest usually puts me all right again. I find, however, that the length of time that I can read is getting shorter and shorter. For the past few days I cannot read for even five minutes before my eyes commence to burn and I have to shut up the book."

The pain does not always restrict itself to the brow or the eyes. Most frequently there is a binding sensation of pain through the temples. In many cases the greatest suffering is in the occipital region, or in the back of the neck, even extending down the spine. In some, uneasiness in the stomach may produce nausea, with chest-constrictions and even heart-palpitations.

It is on account of the reflex annoyances from eye-strain that the eye-affection is so frequently overlooked. The symptoms are mistaken for the primary disease. The headache belonging to the eye-strain is attributed to various causes, depending somewhat upon the bent of the physician's training whether he considers the liver the chief disturbing element in the body, or sees the baneful influences of neuralgia in every systemic derangement. If the person has a uterus, it concentrates all the attention of some physicians, who find in the term "*womb-disease*" a talisman that does away with the necessity for any other diagnosis. The patient often runs amuck of the doctors; treated for biliousness by one, for dyspepsia by a second, for neuralgia by a third, for malaria by a fourth, and, if a female, for uterine irregularities. The only marvel is how confiding patients submit month after month to these varied opinions, feeling all the time that they are not taking one single step towards permanent relief. When they rest, let them take whatever medicine is given them, they get better of the head-disturbance. Unfortunately, they are thereby encouraged in the bad medical course that they are pursuing. When they take up their work again, headaches follow. It takes these unobservant patients years to find out this sequence, wading through long, tedious, annoying, and depressing courses of treatment before the discovery is made that the eyes are the cause of the whole trouble. If the sight is positively faulty, relief is much more likely to come early, at least in the large cities where eye specialists can be conveniently consulted. It is those that have apparently good sight that suffer so long at the hands of general practitioners, spending their substance in the vain search for the cause of their persistent headaches.

Now let us see whether some simple law cannot be established to guide aright to a proper diagnosis even a general practitioner, as most of you must be. An astigmatic headache does not require the taking

of temperature, counting the pulse, or an examination of the tongue. Because a patient does not have an action from his bowels every day and suffers with headache, do not imagine that he needs purgatives. Astigmatism is not a disease to be treated by drugs. It means a defective shape of the eyeball, a mechanical fault in the form of the cornea, to be corrected by mechanical appliances, as a short leg is made to work well by a thicker heel. This faulty shape interferes with the proper working of the eye as an optical instrument. It demands an overtax on the part of the eye-muscles to bring about a needed effect. It is an eye-strain that causes pain in all parts of the head supplied by the fifth pair of nerves, the nerve of common sensation to the entire head and face, including the eye.

The typically good eye is not one that happens to be blue, gray, or brown. Outside of appearances the color of the eye goes for nothing. Provided the inner chamber of the eye is properly faced with pigment, it matters not what the visible color of the iris is, so far as good sight is concerned. It is a matter of the greatest importance, however, that the curvatures of the cornea be uniform in all directions, so that light passing into the eye, to make pictures upon the retina, will be perfectly focussed. Under this condition the retinal picture, however microscopic, is sharply defined, and our sight is correspondingly clear and comfortable. In the eye are strong condensing media, with great magnifying power. They are designed to concentrate light to a short, sharp focus. This act is disturbed if the transmission of light through the front of the eyeball is not uniformly accomplished. Astigmatism means this interference of the direction of light entering through the glassy window of the eyeball.

In astigmatism the shape of the eyeball is altered as if it had been squeezed laterally out of its true ball-form. This destroys the uniformity of the various diameters of the cornea, making some a little longer or a little shorter than they ought to be, drawing in or flattening out the curved surfaces of the cornea corresponding to these changes in the diameters. These irregularities disarrange the focussing power.

To focus light uniformly, which the comfortable use of the eyes demands, the corneal surfaces must be equally curved in all directions. Good vision means a picture clearly focussed on the retina by the dioptric apparatus of the eye. It requires that all the condensing media shall act so as to insure perfect concentration of light. The cornea and the crystalline lens must work in perfect harmony to produce this effect. In well-shaped eyes this is done without apparent effort.

We have already studied the long and the short or flat eye, called the *myopic* and the *hyperopic* eye. In each of these two classes of deviations from the well-formed round eyeball the cornea and lens work perfectly together. They make a true focus. If the eye be of the proper round form, the retina is placed just where it should be to receive the perfectly-focussed rays of light emanating from any visible object. The result is a clear, well-defined picture thrown upon the sensitive inner coat of the eyeball.

If the eye be the long oval one of *myopia*, the perfect focussing is made before the retina is reached. As there is no screen at this focal point of the lens to receive the focussed rays, they cross and continue their course, scattering as they go. By the time they reach the distant retina in the myopic eye, the picture has lost its sharpness of outline. A more or less blurred impression is received upon the badly-placed retina and is interpreted as such by the brain. The degree of defective vision, or the greater or less blurring of the outlines of the picture, will depend upon the distance which the retina has receded from the proper focus of the lens. In some long eyes, in which the deviation from the normal round shape is excessive, the light coming from distant objects makes in the eye such ill-defined shadows that the brain has nothing definite to interpret. Persons with such eyes live in a perpetual fog, and can see clearly only things that are immediately around them.

In a second class of cases, called hyperopic or flat-eyed, the retina is placed so near the lens that it catches the rays of light which enter the eye-chamber before they have been focussed into a picture. The result in such cases must also be a mingling of outlines and necessarily a blurred image. The flat eye can in a measure correct the fault through the action of the accommodating muscles. These allow the lens to become more curved and to shorten its focus. This sharpens the lines of the retinal picture and makes vision perfect.

We have already studied clinically and didactically these deviations from the normal standard of round eyes, called *emmetropic*, because they can focus distant light upon the perfectly-placed retina without muscular effort.

Irregularities in the curves of surface of the cornea may be found in connection with either myopic or hyperopic eyes. The retina may be displaced antero-posteriorly as well as the cornea distorted by irregular curvatures. In a very large number of cases, of which two of the patients now before you are examples, the eyeball is properly formed in so far as the relations of the retina and lens are concerned.

So far a good emmetropic eye exists, but the cornea is distorted into astigmatism in one of its directions. This makes the act of focussing a greater effort than nature designed. The deviation in the curvatures of the cornea converts this surface into two condensing lenses, each with a different focus. The faulty picture made by light passing through one corneal plane blurs the sharp picture made by the other. To see an object clearly with such an eye two pictures must be focussed upon the retina, one so immediately following the other that the double impression seems to be instantaneously produced. This is effected by the action of the accommodating muscle in the eye changing the surface of the lens so as to adapt it to the irregular corneal surface. In the act of reading with such an irregular cornea every word seen requires two images, or a double focussing. This is equivalent to a contraction and then a relaxation of the ciliary muscle. This makes a voluntary choreic movement which will sooner or later excite pain, first in the eye, then a pressure as it were behind the eyeball, and finally a pain in the head. When the intraocular eye-muscles have become irritable, this pain is excited by only a few minutes' use. All near work has to be given up. The eyes become even sensitive to light. They are slightly hyperæmic, they burn, or otherwise feel uncomfortable.

I find that this sequence of eye-work, eye-strain, and headache is most conspicuous in the slight corneal deviations. When the irregularities in the corneal curvatures are very marked, the eye, knowing it, ceases to make the effort for sharp vision. It puts up with the blurred impression on the retina, which does not cause headache to the degree that the smaller deviations excite.

Now let us see how the general practitioner might detect this annoying eye-trouble and apply the proper remedy. Specialists who have daily occasion to use the ophthalmoscope, and are familiar with every variation which the focussing of the fundus produces, can by this instrument readily detect differences in the appearances of the retinal vessels. They can also determine which of the lenses of the ophthalmoscope will bring these dull vessels sharply into view. The corresponding cylinder to this correcting spherical lens will correct the astigmatism. The manipulation of the ophthalmoscope to elicit this information requires much more experience than the general practitioner can obtain.

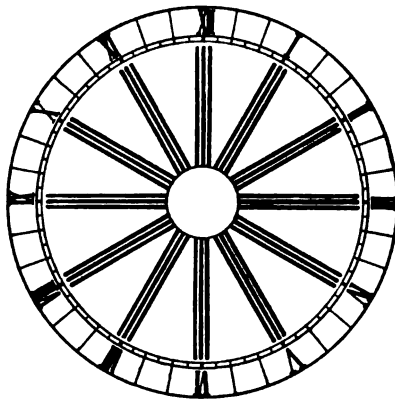
The same must be said for keratotomy, or, as it is called, the shadow-test. By the use of a mirror, rotated before the eye of the observer at a distance of thirty inches from that of the patient,

crescentic shadows are made by the reflected light thrown into the pupil, especially when this has been enlarged by a mydriatic. As the mirror is tilted up and down or from side to side, these new-moon shadows are more or less deep and are more or less active in their movements, depending upon the degree of corneal curvature. Any spherical lens which, when placed before the eye needing an examination, diminishes these shadows to the minimum represents the cylindrical lens that will correct the astigmatism. The direction from which the shadow comes indicates the angle of the faulty refraction.

Expensive instruments, as the ophthalmometer, devised by Javal and by others, are designed also for the detection of astigmatism. These are very costly, and therefore are not likely to be among your instruments as general practitioners.

A very simple method of detecting astigmatism, which you can all learn to use, is by the aid of this astigmatic card of Dr. Green, which I hang upon the wall in this good light (Fig. 1). It represents a clock-dial about one foot in diameter. There are three clean black lines in groups, running from each hour-number directly across the card. They are all of the same size, are of equal blackness, and are bold enough to be clearly seen by a good eye at twenty feet. I place in this chair, twenty feet from the card, one of these patients who has good vision, but uncomfortable eyes after reading. If, after a *careful* scrutiny of the card, with one eye at a time, all the lines are seen equally black and sharply defined, no astigmatism exists. The eye must focus these lines, crossing each other, at all angles and with equal clearness. This patient, however, does not see all the stripes equally black. Some look clear and sharply cut, others look faded. The dull lines are always those crossing the black ones at right angles. He sees with the right eye, the left being closed, the lines running from XII to VI of the clock-dial as very black ones; those running from III to IX are grayish. Some patients will call the duller lines brown, and some will see them as tinted either red or blue. The discolored lines establish at once a positive diagnosis of

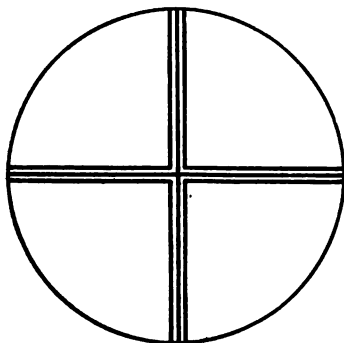
FIG. 1.



astigmatism, and fix the direction of the defect in the eye undergoing examination. If one group of lines is black and those at right angles dull, the case is one of simple astigmatism; this means a deviation of the corneal curvature from its true form in one direction only. Each eye is tested by itself. Usually they agree in the extent of the fading of the lines and also in the direction of the fault. Sometimes, however, they differ widely, and hence each eye must be specially tested.

This patient sees best the group of lines running from XII to VI. I now hang up over the clock-dial a second card, which shows on its face only two groups of equally black lines,—viz., from XII to VI, which he sees clearly, and a cross group, from III to IX, which to him are blurred (Fig. 2). I place alternately before the eye under

FIG. 2.



examination the weakest convex and weakest concave spherical lens of the trial case. He selects one of them as clearing up the clouding of the dull lines. If he selects the convex glass, it shows that his astigmatism is hyperopic, or that the cornea is flattened in its faulty direction. If the concave lens is accepted, it is a case of myopic astigmatism, or too much curvature in the faulty direction. The selection of the glass indicates at once the direction in which the examination is to be con-

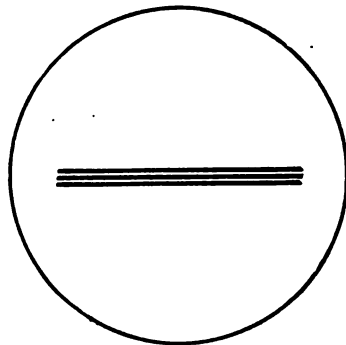
tinued. After convex or concave lenses increasing in strength are in succession placed before the eye of the patient, the one which takes away all the shading from the dull lines and makes them very black is the lens which corrects the astigmatism. But as this spherical lens focusses in all directions, while it clears up the dull lines it makes the good ones dull in like proportion. In this respect it simulates two high heels for one short leg. These must not be put on each foot, or they make the limp as bad as ever. The faulty diameter of the cornea is in one direction only, and we need a glass which will only focus in one plane. Such is the nature of cylindrical lenses. They do not curve in all directions from a common centre, as would a section from a ball or sphere. They have, as it were, a ridge-pole or straight line running across them, as would be the case when a cylindrical block of wood is split lengthwise. They resemble the cover of a wagon, as it curves from side to side, over the top bar which runs the length of the wagon from the driver's seat to the tail-board and over which the

canvas cover is thrown. Light passing through the ridge-pole surface is not refracted. In this direction the lens resembles a piece of window-glass. The refractive surface is only in the direction of the curvatures. For each spherical lens of the trial case there is a corresponding cylindrical lens. These lenses are known by the number of inches they focus.

A lens focussing at one inch, and therefore very strong, is accepted as the standard unit of measurement. One that focusses at four inches is only one-fourth as strong, and is properly marked with the fraction. The smaller the fraction the weaker the lens. Should a No. $\frac{1}{8}$ + spherical make the dull lines bright, at the same time making the bright lines dull, a No. $\frac{1}{8}$ + cylinder, with the flat part of the glass held in the direction of the naturally dull lines, makes the dull lines bright without interfering with the clearness of those naturally bright. The result is a clear view of all lines, the evidence of a distinct retinal picture and of the correction of the irregular focussing of the faulty cornea. After both eyes have been examined and the fault-disks in each detected, proper cylinders set in spectacle-frames, with the axis of the lens fixed in the direction of the angle of the fault as found in each eye, makes the focussing of light easy and does away with all straining overwork of the ciliary muscle. It relieves the eye-pains and the headache which these eye-muscle-strains occasioned.

In the case of the school-girl all the lines of the clock-dial are blurred, some being seen more indistinctly than others. The best lines with her right eye run from I to VII, and with the left eye from XI to V. Her disturbance is not in the perpendicular lines nor in the horizontal ones, but in the oblique direction. Having closed the left eye so as to enable me to examine one eye at a time, I place over the clock-dial a disk of pasteboard having only one group of lines which run from I to VII of the clock-dial numbers, which is the direction of her best vision (Fig. 3). I now try the eye with weak convex and concave lenses. She selects the concave as the one which makes the stripe of three lines brighter. Her case is one of compound myopic astigmatism. It means near-sightedness in all directions, but more in one

FIG. 3.



than in another. Trying concave lenses, always selecting one a little stronger than the preceding, I find that a No. $\frac{1}{8}$ — glass makes the dull lines from I to VI very bright; No. $\frac{1}{9}$ —, a weaker glass, not so bright; No. $\frac{1}{7}$ —, a stronger glass, over-correcting and therefore slightly blurring the lines. No. $\frac{1}{8}$ — is selected, then, as the concave spherical glass which corrects her near-sightedness. When she looks at the whole clock-dial, with all the groups of lines exposed, with this glass, I to VII come out very clearly. All the lines are much better than without the glass, but those at X to IV, which are at right angles to the ones at I to VII, are still a little cloudy. When a No. $\frac{1}{2}$ — lens is placed over the No. $\frac{1}{8}$ — already on the eye, the group of dull lines X to IV come out very clearly. This shows that a No. $\frac{1}{2}$ — cylindrical lens will correct the astigmatism. All the lines are now clear when this cylinder is added to the spherical lens, and she reads the proper test-type letters which indicate that with this combination of glasses her sight becomes perfect. The optician will be instructed to combine these two glasses in one lens,—viz., a No. $\frac{1}{8}$ concave spherical glass with a No. $\frac{1}{2}$ concave cylinder, set so that its axis covers the duller lines of the clock-dial. When this is constantly worn for distant vision, it will give her clear sight for black-board work at school. For reading only the cylindrical lens will be used. She must therefore have two pairs of spectacles, the plain cylinder for study in one frame, and the combination for walking in another.

Sometimes the eye-muscles become so irritable and irregular in their action as to conceal the true degree and also the direction of the corneal fault. Under such conditions some mydriatic is used to paralyze temporarily the action of these intraocular muscles of accommodation. I find that a few drops of a one-per-cent. solution of homatropia will usually put an end to this spasmodic condition and will permit the error of refraction to show itself in its true light.

I have gone through the working of these cases before you to show how astigmatism is to be detected and corrected. These patients brought to the clinic happen to be simple cases of astigmatism. They are intelligent, so that they give prompt and proper answers to the questions asked. It is not always so easy to discover these faults and to apply the proper remedy, for there are persons who are slow in their appreciation of shades and need much more time to detect these differences.

What I desire you to know now, and to remember hereafter, is that persons who are born with irregular-shaped corneas must have more or less difficulty in making retinal pictures. Should they use

their eyes much, it will cause discomfort in the eyes and also pain in the head. When the uneasiness of the head is produced or is increased by eye-work, do not be misled into the error of believing that the eyes cannot be used because the head hurts. Remember that the head hurts because the eyes do not work smoothly. I saw over one thousand of these headache-cases from eye-irregularities last year. These had all been under the care of the family physician before they came to the specialist to find out why they had not been relieved after long and varied courses of treatment. The trouble with them had been a positive error in diagnosis. With few exceptions they had been treated for supposed diseases of healthy organs. The eyes which had produced these various functional disturbances were seldom inflamed, and as they usually looked well they were not considered the disturbing element. I would advise every medical practitioner to purchase one of these clock-dial plates and hang it up in his office in a good light. You will find it quite as valuable to you as a clinical thermometer, a stethoscope, or a tongue-depressor. When a patient apparently healthy complains of more or less persistent headache, consult this astigmatic test-card instead of your *Materia Medica*. Benefit to both your patients and your reputation is much more likely to come from its study. You will then be able to know at least where the fault lies, and recognize the uselessness of medication; and you can put your patient in the way of obtaining relief if you do not feel able to furnish it yourself.

Otology.

STUBBORN INFLAMMATIONS OF THE EXTERNAL AUDITORY CANAL.

WRITTEN EXPRESSLY FOR "INTERNATIONAL CLINICS."

BY ALBERT H. BUCK, M.D.,

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INFLAMMATION of the external auditory canal is encountered in practice under quite a variety of forms, and it is often a difficult matter to treat it successfully, or even to diminish its activity to any great extent. In using the expression "forms" I do not wish to convey the idea of separate and distinct types of disease, for of such there are few indeed involving the outer canal of the ear. "Pictures" is perhaps the term which will convey more accurately my meaning. As it is mainly from these visible lesions or pictures that the physician forms a judgment in regard to what is the proper treatment to be pursued, I shall devote a little space to their consideration.

In not a few cases the external auditory canal presents changes in color, form, or texture which represent insignificant departures from the normal condition, and yet the patient experiences a great deal of discomfort in the affected ear. The following case is an illustration.

In the autumn of 1885 I was consulted by a lady, about thirty years of age, who complained of an itching in the right ear which had from time to time caused her considerable discomfort, and which during the preceding two weeks had been associated with occasional pain and a scanty discharge. The hearing had apparently been affected only to a slight extent. Her general health had been only fair, and on one or two occasions she had experienced some pain in one or more of the small joints.

An examination with the mirror and speculum revealed an intact and uninflamed but thickened drum-membrane, a canal slightly red and swollen, and a drop or two of pus filling the cul-de-sac between

the membrana tympani and the lower wall of the canal. After careful mopping I found that the pus came from a limited area (about four by eight millimetres) of skin on the lower and anterior wall of the osseous portion of the meatus. This patch lacked but little of being in a granulating condition.

As a first step I advised the attending physician to instil into the ear, after the pus had been thoroughly removed, a strong solution of silver nitrate (sixty grains to the ounce of water), and to allow it to remain there for about two minutes. I also laid considerable stress upon the importance of douching the ear twice a day regularly with lukewarm water saturated with boric acid; this procedure to be followed each time—after the canal had been dried as gently as possible with absorbent cotton—by the introduction of two or three drops of vaseline oil containing a little oil of cade (one drop of the latter to an ounce of the former).

Under this plan of treatment the patient very soon obtained entire relief. The itching returned at times during the subsequent years, but it was not until during the present year (1890) that the ear began to give her more or less continuous trouble. According to her account, the itching would sometimes be accompanied by a general reddening of the auricle; and, whenever she indulged her desire to scratch the affected canal by making firm pressure upon the skin in front of the tragus and moving it upward and downward a few times, there would appear at the orifice of the canal enough watery secretion to make a small stain upon the handkerchief which she had applied to the ear. When I examined the canal I was surprised to find how slight was the evidence of anything like inflammation of its walls. In fact, it was only upon the closest scrutiny that I was able to detect a faint localized redness of the lower wall of the meatus, half-way between the orifice and the drum-membrane. The parts everywhere seemed to be perfectly dry. At my request the patient repeated the manipulations described above. I examined the ear immediately afterwards, and found that the affected area had become well defined by reason of the increased redness of the spot, and was covered with an appreciable quantity of thin serous fluid.

The case is still under observation.

Here, then, is an instance of a case in which the recognizable lesions were out of all proportion to the degree of annoyance suffered by the patient. In many cases (women more particularly) considerable allowance must be made for the nervous susceptibility of the patient, who is

thus led to magnify the symptoms which she experiences; but in this instance I feel confident that there has been very little, if any, indulgence in exaggeration on the part of the patient.

I have seen comparatively few other cases in which there existed, in the osseous or membranous portion of the external auditory canal, a similar circumscribed area of skin and periosteum, the nutrition and nervous supply of which were so altered from the normal condition that a trivial irritation, such as that which I have described above, would be competent to cause it to discharge like an ulcerated or granulating surface. In most of such cases (the present one included) I have been able to verify the fact that at some earlier period of the patient's life there had been a purulent inflammation of the corresponding middle ear, and I have been disposed to attribute the localized weakness in the outer canal to alterations in nutrition of the affected part produced at the time, and in consequence, of the original middle-ear affection. But a further factor is required here, as it seems to me, to explain the alternation of periods of quiescence, sometimes lasting for years, with those of more or less marked irritability. This factor is supplied, I believe, by the condition called gout or lithæmia. Further on, I shall have occasion to refer to this subject again.

A more common type of chronic inflammation of the external auditory canal is that which is characterized by diffuse redness and swelling of its cutaneous walls; in addition to which there may be a scanty or even a fairly active discharge, or a desquamative process may be a distinctive feature of the trouble. In some instances the discharge seems to possess acrid properties, and, in consequence, other neighboring parts become inflamed or even ulcerated, from the mere contact of the corrosive fluid with the part. Thus, fissures are often seen at the orifice of the auditory canal, and any part of the auricle may be found in an ulcerated condition when special measures have not been adopted to prevent the discharge, especially at night, from trickling down into the troughs and hollows of this organ. In the canal itself all sorts of lesions may be observed when the disease has been allowed to run its course undisturbed for some time. Thus, for example, the active formation of granulation-tissue may take place at any part of the walls of the canal or even directly upon the surface of the drum-membrane itself.

I have recently had a case of the latter description under my care, —the only one of the kind that I remember to have seen. I found the region above and behind the short process of the hammer, and the

larger part of the posterior half of the drum-membrane, converted into a mass of tolerably firm granulation-tissue. At its lower and posterior border the mass represented little more than a red, succulent, very much thickened drum-membrane, while at and around the short process the mass projected sufficiently for me to remove a portion of it with the snare. The outer canal elsewhere was only mildly inflamed, and contained but a small quantity of purulent discharge. The hearing for voice-sounds was scarcely at all affected.

I felt confident that I was dealing here with a case of primary middle-ear disease, with only secondary manifestations in the external auditory canal. This view I was not disposed to abandon even after I had failed to find any fistulous channel in the vicinity of Shrapnell's membrane, and although the previous history did not furnish sufficient data to favor the belief that the inflammatory processes observed in the auditory canal were simply the product of a former affection of the middle ear, which latter affection had in the mean time ceased to be active. There was one point in the past history of the patient, however, to which I paid but little attention at the first, but which, in the light of subsequent events, leads me to believe that he had been subject to a mild form of eczema of the canal for some time previously; I refer to the statement that impacted wax(?) had been removed from both ears on several occasions at intervals of a few years.

By aid of the snare at first, and of chromic acid afterwards, I soon succeeded in destroying all the exuberant tissue in the region of Shrapnell's membrane; the patient in the mean time employing faithfully Angelo's ear-douche, with warm water, two or three times a day. In less than three weeks the drum-membrane and the surrounding region had very nearly resumed their natural appearance, and I question whether anybody seeing the ear then for the first time would have believed it possible that such gross lesions as I have described above had been present in this ear at such a recent date. There remained, however, one lesion which had previously escaped notice, doubtless because it was merged in the general swelling of the parts. This consisted of an elongated oval patch, of a silver-grayish color and sharply-defined borders, occupying the greater part of the posterior half of the membrane. Its surface was dry. Pressure upon the patch at different points with the end of a slender silver probe revealed the fact that the thickening was confined, apparently, to the outer surface of the membrana tympani, was perfectly flexible, and presented the closest possible resemblance to a patch of psoriasis, as seen in other parts of the body. The grayish appearance seemed to be due to the semi-

detached condition of the epidermal scales, and to the fact that these numerous small planes were all tilted at different angles. It was not found possible, however, to detach, by means of the middle-ear probe or the small curette, any of these separate masses of epidermis. The underlying thickened tissues were evidently congested.

I do not know whether the small circumscribed patch which I have described above was really psoriasis or not. As the other lesions had all disappeared under treatment, while this patch alone continued to exist as a separate lesion, I should be disposed to believe that we were dealing here with the accidental coexistence of two affections in the same ear, the eczema being the only active one of the two. However this may be, the question is one of no great practical importance.

In the cases to which I have thus far referred, only the soft tissues of the external auditory canal were involved to any appreciable degree, and until quite recently I have held the belief that, no matter how long these chronic gouty or lithæmic inflammations of the canal might continue, the surrounding bony walls would never become diseased to any appreciable degree; and that the finding of a sinus leading into the substance of the bone, or of a circumscribed area of denuded and roughened bone, in cases of disease of the auditory canal, invariably indicated that the bone-disease was the primary affection, and the inflammation of the soft parts of the canal merely a secondary manifestation. The following case, however, seems to me to furnish sufficient grounds for the belief that the same subtle influence—whatever be its nature—which can spontaneously develop an obstinate inflammation of the skin lining the external auditory canal, may also, under certain conditions, produce inflammation of the surrounding bone; thus seemingly justifying the notion held by the older writers on otology, that an inflammation of the soft parts lining the external auditory canal may extend to the surrounding bony walls, and even eventually to the deeper-lying cellular structures. This belief, it will be observed, attributes to gout or lithæmia powers akin, and not far inferior, to those known to be possessed by constitutional syphilis.

The patient, a lady, about thirty-eight years of age, and suffering from well-marked diabetes insipidus following an attack of diphtheria which occurred several years previously, consulted me on the 6th of October, 1887, for a subacute catarrhal inflammation of both middle ears, characterized by almost constant tinnitus and an unpleasant sense of fulness in the ears, and for a subacute eczema of both external auditory canals, characterized by a slight discharge from the right ear

and, at times, almost intolerable itching. In general conversation her hearing showed no signs of being deficient, but on testing it with the watch (a loud ticker), I found that she could hear it only at a distance of three inches on the right side and two inches on the left. There was a certain degree of naso-pharyngeal catarrh, and the patient admitted that for several months past she had taken very little exercise, and at the same time had not altered her habits of eating. Her weight was decidedly above the normal standard.

I prescribed a restricted diet, more physical exercise, the use of a douche with tepid water in the right ear, local applications of oil of cade and vaseline in both ears, spraying the nasal passages with listerine and water, occasional applications of a silver-nitrate solution to the vault of the pharynx, and Politzer's inflations. Very little, if any, improvement followed this plan of treatment. My impression is, however, that the advice about diet and exercise was not followed.

From October, 1887, to January, 1890, I saw the patient at irregular intervals. The memoranda in my case-book simply show a record of ups and downs, with no special tendency to grow materially worse. The discharge from the right ear, although scanty, was almost constant. On the 31st of January, however, she began to have a series of boils in the right external auditory canal, and she continued to suffer in this way for a period of several months, despite the employment of the various local remedies which are commonly tried in such cases,—Hebra's diachylon ointment, solutions of silver nitrate (of various strengths), powdered boric acid, etc. The sulphide of calcium was taken in small doses for a short time on two or three occasions, and seemed to exert a restraining influence upon the furuncular tendency. In the mean time the left ear had also begun to discharge, owing to a diffuse inflammation of the membranous portion of the canal.

On the 14th of May I found, on the lower wall of the right meatus, not far from the outer orifice, a circumscribed patch of granulation-tissue, which I touched freely with a strong silver-nitrate solution (one hundred and twenty grains to the ounce). This cauterization caused the ulcer to heal promptly, and for about a month afterwards the ear gave her very little trouble. The left ear also at this time had resumed a fairly quiet condition.

On the 16th of June, when I saw her for the last time before she went away to the country for the summer, there was a little tenderness at the orifice of the right canal, as if a fresh boil were developing; but in all other respects both ears seemed to be as free from irritation as they had been at any previous time for several months past.

On the 6th of October, when she returned from the country, I found the left external auditory canal in very much the same condition as I had seen it on the 16th of June; that is, the canal was a trifle smaller than it should be and there was more fulness of the blood-vessels than was normal. On the right side, however, the condition of the auditory canal had become very much worse. A polypoid growth, about the size of a small pea, occupied the orifice of the canal. By aid of a bent probe it was ascertained that this growth sprang from the edge of an opening at the bottom of which denuded bone could be felt. After the removal of this polypus with the snare, it was seen that the membranous walls of the canal, apparently throughout the entire length of the osseous portion, had been converted into granulation-tissue which completely obliterated the calibre of the meatus. Neither on this nor on any subsequent occasion was I able to determine accurately whether any portion of the cutaneous lining of the canal had escaped this conversion into granulation-tissue. Along the upper wall, down to a point not very far distant from the membrana tympani, the skin *seemed* to have retained a smooth, firm surface; but, as I have already said, I could not ascertain positively whether such was the fact or not. On paper the problem no doubt seems easy to solve, but in reality the task was found to be quite the reverse. The lack of space and the facility with which such tissues bleed when manipulated are the chief obstacles in the way of a satisfactory examination. The mastoid integuments were red, swollen, and tender, and the auricle was slightly dislocated forward.

Although I inquired carefully into what had taken place during the interval between June 16 and the time of her return to the city, I failed to discover any facts which would warrant the belief that she was suffering from inflammation of the mastoid process of middle-ear origin. She had had a great deal of pain in the ear and throughout the right side of the head during the summer, but it had clearly begun in consequence of a furuncle at the orifice of the canal, and had apparently been kept up by rather vigorous efforts, on the part of the different medical men whom she consulted, to cause healing of the furuncular cavity.

Her temperature was found to be normal; and I might add that on no subsequent occasion did it rise above 99.5° F.

During the next three weeks I made various attempts to remove or materially reduce the bulk of the granulation-tissue in the canal, but they effected little or nothing, as the patient could not for any length of time bear the pain resulting from such interference. On the

31st of October, therefore, she was put under the influence of ether, and I proceeded to remove—partly by means of suitably-curved knives and partly by the aid of Hinton's fenestrated forceps—the larger part of the obstructing mass. In this way I obtained a clear calibre from the drum-membrane outward, of fully five millimetres in diameter. The bony floor of the canal felt rough, and I accordingly scraped it with a sharp-edged spoon. As a last step I insufflated a liberal quantity of iodoform and sealed up the orifice lightly with cotton sprinkled with the same drug.

Three days later I found that no unpleasant reaction had followed the operation, and that the canal still retained a calibre of perhaps four millimetres in diameter. I therefore proceeded to inject into it a thirty-grain solution of silver nitrate, by means of a slender glass middle-ear pipette, in the hope of stimulating these relaxed tissues to contract and resume the firm condition of natural skin. Instead, the very opposite effect was produced, and in the course of forty-eight hours the calibre of the canal had again become obliterated.

From that time to the present I have left the ear almost strictly alone. On two occasions, at intervals of about three weeks, I removed with the snare the separate granulation-growth at the orifice of the canal. I did this simply because I was afraid that it might, by reason of its size and location, interfere with the drainage from the sinus and from the deeper parts of the ear.

During the first part of November the patient was obliged to keep her bed, on account of a rather severe attack of arthritis of the right knee. The pain and swelling in the mastoid region became more marked at this time, and I accordingly advised the application of flax-seed-meal poultices to the tender and swollen mastoid integuments, twice every day, and for a period of one and a half or two hours each time. Under this régime, which was carried out faithfully for at least one week, the swelling and redness disappeared, and very little tenderness remained.

During the first week or ten days of December there were slight evidences of diminishing irritation in the granulating canal. The discharge, which all through the course of the disease had been scanty and rather thin, remained unchanged in character and quantity; but the granulation-tissue itself had become paler and presented a withered appearance, as if it had begun to waste away spontaneously, under the influence of the dietetic régime which her regular medical attendant had instituted a short time previously, and to which I shall refer again further on.

A few words will suffice to say all that is required in regard to the progress of the disease in the left ear. Already during the month of October this ear began to grow worse. The calibre of the canal became smaller and smaller, and the inflamed walls seemed to be taking on the characteristics of granulation-tissue. At intervals of a week or ten days a furuncle would appear on the lower wall of the orifice, break, and then heal up, to be followed in due time by a fresh one at or close to the same spot. The discharge remained constant, but was not copious. Solutions of acetate of lead and of nitrate of silver of different strengths, powdered iodoform, and boric acid, and a variety of ointments were tried in succession, but all to no purpose; they seemed rather to make the ear worse. All through this period the ear was decidedly painful, even more so at times than the right, which certainly seemed to be the worse affected of the two.

On about the 20th of November the attending physician induced the patient to submit to a trial, for a few weeks at least, of a restricted diet; such articles as sugar, milk, fruits, vegetables, alcoholic beverages, and even bread (except a limited amount of thoroughly-dried bread and of zwieback) being excluded from the list of things which she might eat. Already at the end of two weeks the beneficial effects of this plan of treatment began to show themselves. She could sleep better and felt able once more to take out-door exercise, a thing which she had not been able to do for many weeks. The pain in the ears diminished appreciably, no more furuncles formed in the left ear, and the calibre of the canal of this ear began steadily to grow larger. I then ventured to instil into it a strong solution (forty grains to the ounce) of silver nitrate, and was pleased to find that it produced only satisfactory results; that is, it caused in the course of two or three days a decided reduction of the swelling of the walls of the passage and a corresponding diminution of the discharge. After the lapse of a few days I repeated the application, and obtained a still further reduction of the swelling, until now (December 13) the canal is large enough to permit a fairly good view of the drum-membrane.

The effects of the dietetic treatment upon the right ear have been, as I have already stated, less striking, but there can be scarcely any doubt that in that ear too a beneficial effect has been started.

The dietetic régime, which has now been made somewhat less stringent, is to be continued for a further period of time.

Despite the incompleteness of the records, the cases reported above furnish food for reflection in several respects. In the first place, they

are all, as I interpret them, cases of chronic eczema of the external auditory canal ; that is, they are all cases in which the demonstrable lesions seem to owe their origin primarily and chiefly to a faulty condition of the circulating fluids of the body. This faulty condition is probably due to some disturbance of the processes of assimilation and retrograde metamorphosis ; and, for lack of more precise knowledge on this subject, we find it extremely convenient to speak of it, provisionally at least, as the *gouty* or the *lithæmic diathesis*. Whether the vaso-motor phenomena which play such an important part in eczema are the result of the faulty condition of the blood, or are the expression of a disturbance of the nerve-centres, of independent origin, is a question which I am unable to answer.

Passing on, therefore, to the domain of observed facts, I will state, in the second place, that eczema of the ear, in its milder grades, manifests itself in the form of inflammations of the external auditory canal, localized or diffuse, which generally yield, for a short time at least, to simple soothing remedies applied to the area affected—such, for example, as the frequent bathing of the part with tepid water, anointing it with simple protective ointments or oils, or dusting it with bland powders—or to those of a more stimulating character, like nitrate of silver, acetum cantharidis, oil of cade, and the yellow oxide of mercury ointment. In the higher grades of the disease all local applications seem to be powerless to effect any perceptible improvement in the condition of the external auditory canal ; and, indeed, in not a few cases they serve only to aggravate the existing inflammation. This is a point to which I specially desire to call attention. It is of great importance, both to the patient and to the physician, that it should be ascertained, as early as possible, whether the case in hand belongs to this latter category or not. The difficulty of ascertaining this fact is great. In the first place, the patient is almost always eager to have other remedies tried when those first employed fail. The physician, too, cannot always feel sure, at any given time in the course of the treatment, that he has reached the point where it is vain to expect any further beneficial effects from purely local measures.

As a case in point I have only to mention the last of the three narrated above. In this instance I have very little doubt that the patient would have fared better if the policy of local non-interference had been adopted at a decidedly earlier date. I should state here, however, that there were moments when I strongly doubted whether my diagnosis of eczema was correct. The thought of sarcoma (right ear) occurred to me at one time, but a careful examination (made

by a competent histologist) of some of the larger pieces of tissue removed from the canal compelled me to give up this idea. Next, the possibility of a syphilitic origin was duly considered; but here, too, a careful investigation of all the circumstances of the case led both the attending physician and myself to abandon this hypothesis as untenable. Finally, the idea of mastoid-cell disease, of middle-ear origin, was difficult to dismiss from my mind. I mention these facts simply for the purpose of showing that a full realization of the nature of the ear-affection came to me only slowly. In fact, it was only after witnessing the progress of the disease in the left ear—from an apparently insignificant inflammation of the membranous portion of the canal to almost the same state of things as I have shown to exist in the right ear—that I felt warranted in attributing the lesions observed in the latter to the same underlying lithæmic condition.

Time alone can settle the question whether the osteitis now presumably confined to the thick plate of bone constituting the external auditory meatus may not involve the adjacent mastoid cells and give rise to veritable mastoid disease, in all its outward manifestations precisely like that which owes its origin to disease of the middle ear.

INDEX TO VOLUME I.

A.

- Abdominal nephrectomy for pyelonephrosis, 144.
- A.-C.-E. (alcohol, chloroform, ether) mixture as an anæsthetic in grave surgical operations, 135.
- Acetum cantharidis, use of, in inflammation of auditory canal, 349.
- Aconite, use of, in plethora, 29.
- Acromegaly, 1.
 - history of case, 1.
 - general description, 10.
 - diagnosis, 17.
 - symptoms, 11-17.
 - treatment, 18.
- Acute septicæmia, as a cause of puerperal fever, 170.
 - tonsillitis or quinsy, 35.
- Alcohol, use of, in chorea, 222.
 - absolute, use of, in antiseptic surgery, 103.
 - use of, as disinfectant for hands, after examination of cancerous vagina, 190.
 - use of, as stimulant in tonsillar diphtheria, 203.
- Alcoholic coma, 88, 89,
 - characteristic symptoms, 89.
 - paralysis, autopsies, 266, 268.
 - differential diagnosis, 270, 274.
 - history of cases, 265, 267.
 - prognosis, 273.
 - treatment, 276.
- Alopecia congenital, 321.
 - treatment, 322.
- Amenorrhœa as caused by syphilis, 177.
 - by malaria, 177.
- Ammoniated mercury ointment, use of, in psoriasis, 304.
- Anæmia, 178.
- Angelo's ear-douche, use of, in inflammation of auditory canal, 343.
- Angina Ludovici in its relation to diphtheria, history of cases, 30, 31, 33.
- Antipyrin, use of, in alcoholic paralysis, 276.
- Antiseptic surgery, 102.
- "Ape's hand," due to atrophy in spinal or peripheral paralysis, 209.
- Apoplectic coma, differential diagnosis of, 89.
- Aristol, use of, in psoriasis, 305.
- Arsenic, use of, in acromegaly, 18.
 - in chorea, 222.
 - in lichen planus, 321.
 - in psoriasis, 301.
- pigmentation caused by, 321.

- Arthritis deformans, 17.
- Astigmatic card of Dr. Green, 335.
- Astigmatism, a very common and often unrecognized cause of headache, 328.
 - diagnosis, 331.
 - differential diagnosis, 333.
 - history of cases, 328.
 - instruments for detection of:
 - astigmatic card of Dr. Green, 335.
 - keratoscopy, 334.
 - ophthalmoscope, 334.
 - ophthalmometer, 335.
- Athetoid spasm and myotonia on voluntary effort, 257.
- Auditory canal, external, stubborn inflammations of, 340.
 - diagnosis, 343.
 - history of cases, 340, 344.
 - treatment, 343, 345, 349.

B

- Bandages, Esmarch's, to prevent hemorrhage in hip-joint amputation, 132.
 - gauze, as dressing for joints in infantile eczema, 314.
- Baths, alkaline, use of, in infantile eczema, 315.
- Belladonna, efficacy of, in acute tonsillitis or quinsy, 36.
- Bichloride solution as a sterilizing agent, 103.
- Blindness as an accompaniment of traumatic hysteria, 232.
- Blood-letting, efficacy of, in plethora, 28.
 - treatment by, in acute uræmia, 94.
- Borated cotton as a dressing in antiseptic surgery, 126.
- Boric acid, use of in inflammation of auditory canal, 341, 348.
- Bright's disease following erysipelas, 82.
 - chronic, apoplexy in occurrence with, 89.
- Bronchitis as a cause of puerperal fever, 170.
- Bruce, J. Mitchell, M.A., M.D., F.R.C.P., 43.
- Buck, Albert H., M.D., 340.
- Byford, Henry T., M.D., 182.

C.

- Cade, oil of, use of, in psoriasis, 305.
 - in inflammation of auditory canal, 341, 349.
- Cameron, J. Chalmers, M.D., M.R.C.P.I., 164.

- Cancer of liver, 77, 78.
 differential diagnosis, 77, 78, 81.
 of penis, 138.
 of the vagina; retained placenta after miscarriage; tubo-parovarian cyst, 189.
 I. Cancer of the vagina: history of case, 189.
 II. Retained placenta after miscarriage: after-treatment, 192.
 diagnosis, 191.
 history of case, 190.
 operation for, 191.
 III. Tubo-parovarian cyst: diagnosis, 193.
 description of, 193.
 history of case, 193.
 Carbolio acid, use of, in lichen planus, 321.
 in urethritis, 186.
 Carmalt, W. H., M.D., 138.
 Catarrhal pharyngitis, 35.
 treatment, 35.
 Cellulitis as a cause of puerperal fever, 170.
 Chapman spinal bags, use of, in sciatic neuritis, 280.
 Cheever, D. W., M.D., 10.
 Chisholm, Julian J., M.D., 328.
 Chloral hydrate, efficacy of, in controlling motorial features of chorea, 218, 222.
 Chlorate of potassium in treatment of syphilitic ulcer of vulva, 178.
 Cholecystectomy, how performed, 158.
 Cholecystenterostomy, 157.
 first performed, 159.
 Cholecystotomy, 157.
 how performed, 158.
 Cholelithiasis, with special reference to its surgical treatment, 148.
 dangers resulting from, 154.
 formation of gall-stones, 149.
 medical treatment, 155, 159.
 ineffectiveness of, 156, 157.
 operations, 157.
 symptoms, 151.
 Cholelithotrixy, 157.
 Chorea, 213.
 history of cases, 213, 214, 215.
 physical examination, 214.
 treatment, 214, 216.
 general, 222.
 subsequent, 223.
 Chromic acid, use of, in inflammation of auditory canal, 343.
 Chrysarobin, efficiency of, in psoriasis, 305.
 disadvantages of, 305.
 Chrysophanic acid, use of, in lichen planus, 321.
 Cirrhotic kidney and liver, 53.
 "Clergyman's sore throat" (dysphonia clericorum), 41.
 treatment, 42.
 Clothing, sterilization of, in antiseptic surgery, 103.
 Codeia, use of, to replace opium in treatment of neurasthenia, 246.
 Cod-liver oil, use of, in anæmia, 180.
 in chronic eczema, 110.
 in infantile eczema, 311.
 in ovariægia, 180.
 in spinal irritation, 180.
 in syphilitic tubercle, 327.
 Cold, exposure to, as a cause of puerperal fever, 172.
 Cold cream, use of, in infantile eczema, 310.
 Cold-water treatment in sexual neurasthenia, 240.
 Colocynth, use of, in neurasthenia, 242.
 Conium, use of, in chorea, 222.
 Conjoined or combined manipulation in diagnosing early pregnancy, 161.
 Contracture distinguished from contraction, 211.
 diagnostic value of, in cerebral affections, 211.
 Corrosive sublimate, use of, in tonsillar diphtheria, 203.
 solution, as disinfectant for cancerous ulcers, 189.
 for flushing womb after removal of retained placenta, 192.
 Cough, treatment of, in phthisis, 43.
 treatment, 44, 46-52.
 Creolin mixture in treatment of syphilitic ulcer of vulva, 177.
 Croton-chloral, use of, in alcoholic paralysis, 276.
 Crustæ lactea, form of infantile eczema, 309, 314.
 Curette, objections to, in removal of retained placenta, 191.
 Cyst, tubo-parovarian, 193.
 Cystitis as a cause of puerperal fever, 170.
- D.
- Dermatology, 298, 306, 316.
 Diplopia, 119.
 Diphtheria (*see* tonsillar diphtheria), 195.
 Diphtheritic membrane, 198.
 Drainage of wounds, 106.
 Dressing, methods of, in antiseptic surgery, 105.
 Duckworth, Sir Dyce, M.D., LL.D., 213.
 Dysphagia, 96.
 history of case, 96.
 prognosis, 97.
 symptoms, 97.
 treatment, 101.
 Dysphonia clericorum, 41.
 treatment, 42.
- E.
- Easton's syrup, use of, in alcoholic paralysis, 276.
 Electricity, electro-therapeutic golden rule as to use of, 228.
 use of, for diagnostic purposes, 208, 211, 255.
 in infantile paralysis, 208, 211.
 in sciatic neuritis, 282.
 in traumatic sore back, 228.
 Elephantiasis, 17.
 Elytrorrhaphy, 184.
 Emotional disturbances as cause of puerperal fever, 171.
 Encephalitis as a cause of cerebral paralysis, 204.
 Endometritis as a cause of puerperal fever, 169.
 Endo- or pericarditis one cause of rise of temperature in chorea, 214.

Epilepsy, differential diagnosis, 87.
 history of case, 95.
 Epiphyseal fracture of upper end of humerus, 128.
 diagnosis, 129.
 treatment, 130.
 Epitheliomata, development of, in seat of psoriatic fractures, 301.
 Ergotine solution, hypodermic injection after removal of retained placenta, 192.
 Erysipelas attendant upon, or following, diseases of liver and kidneys, 82.
 Ether as disinfectant for hands after examination of cancerous vagina, 190.
 Extra-uterine pregnancy distinguished from displacement of uterus, 162.
 Eye, emmetropic, 333.
 hyperopic, 333.
 myopic, 333.

F.

Face, dressing for, in infantile eczema, 314.
 Faradization, general, in treatment of ovari-
 algia, spinal irritation, and anæmia, 180.
 Favus, differential diagnosis, 309.
 Ferrier, David, M.D., F.R.S., F.R.C.P., 265.
 Finlayson, James, M.D., 30.
 Follicular angina (follicular tonsillitis?), 196.
 differential diagnosis, 197.
 Forchheimer, F., M.D., 195.
 Fox, George Henry, M.D., 298.
 Functional nervous troubles: neurasthenia,
 its occurrence in young and old, symptom-
 atology, and treatment, 237.

G.

Gairdner, W. T., M.D., 62.
 Gaston, J. McFadden, M.D., 132.
 Gelatin, use of, in infantile eczema, 314.
 Glycerin salves in treatment of ulcers, 112.
 Goa powder, use of, in psoriasis, 305.
 Goodell, William, M.D., 189.
 Gray, Landon Carter, M.D., 204.
 "Gynaecological hand," advantages of (see
 "Obstetric hand"), 191.
 Gynaecology and obstetrics, 160, 164, 176,
 182, 189.

H.

Hæmatemesis as an accompaniment of trau-
 matic hysteria, 232.
 Hands, cleansing of, in antiseptic surgery, 102.
 Head, a case of injury of, 114.
 differential diagnosis, 117.
 history of case, 114.
 treatment, 122.
 Headache as caused by astigmatism, 328.
 Heart, fibroid degeneration of, 53.
 Heath, Christopher, F.R.C.S., 35.
 Hebra's diachylon ointment, use of, in in-
 fantile eczema, 308.
 Herpes in connection with jaundice, 82.
 Hip-joint amputation, Esmarch's bandage to
 prevent hemorrhage in, 132.
 high rate of mortality in, 132.
 operation, method of, 133.
 preparatory treatment for, 135.
 Wyeth's, 132, 134.

Hospital sore throat, 39.
 symptoms, 39.
 treatment, 39.
 Hulke, J. W., F.R.C.S., F.R.S., 113.
 Humerus, epiphyseal fracture of the upper
 end of, 123.
 diagnosis, 129.
 history of case, 128.
 physical examination, 129.
 treatment, 130.
 Hutchinson's teeth, 41.
 Hyde, James Nevins, A.M., M.D., 316.
 Hydrocephalus as a cause of cerebral paraly-
 sis, 204.
 Hydrothorax (pyothorax?) with dextrocardia,
 62.
 diagnosis, 64.
 Hypertrophic cirrhosis of liver, 82.
 differential diagnosis, 82.
 Hysterical coma, characteristic symptoms of,
 89.
 differential diagnosis, 89.

I.

Ice-cream, use of, in tonsillar diphtheria, 203.
 Infantile eczema, 306.
 diagnosis, 307.
 differential diagnosis, 309.
 history of cases, 306, 312.
 prophylaxis, 315.
 treatment, 308, 310, 311, 312, 314.
 Iodal, use of, in treatment of syphilitic ulcer
 of vulva, 177.
 Iodide of potassium, use of, in acromegaly,
 18.
 in alcoholic paralysis, 276.
 in traumatic perioranitis aggravated
 by syphilitic taint, 122.
 Iodoform, objections to, for after-dressing, 105.
 use of, in suppurating and tubercular
 cases, 105.
 in syphilitic ulcer of vulva, 177.
 Iodoform-gauze as a dressing in antiseptic
 surgery, 126.
 Iron, iodide of, in infantile eczema, 311.
 muriated tincture, iodide, and albumi-
 nate, in treatment of ovari-
 algia, spinal
 irritation, and anæmia, 181.
 tincture of, in urethritis, 186.
 use of, in syphilitic tubercle, 327.
 Ischæmia as an accompaniment of traumatic
 hysteria, 233.

J.

Jaundice, a case of, with enlarged liver, 76.
 in connection with herpes, 82.

K.

Keen, W. W., A.M., M.D., 102.
 Keratoscopy, 334.

L.

Lactopeptine, use of, in infantile eczema, 310.
 Lard, disadvantages of, in infantile eczema,
 310.
 Laryngology, 285.
 Laryngotomy in acute oedema of pharynx, 38.

Larynx, stricture of, 285.
 history of case, 285.
 tracheotomy tubes, 286.
 treatment, 293.

Lead palsy, differential diagnosis, 274.

Leontiasis ossea, 17.

Lichen ruber acuminatus, differential diagnosis, 319.

Liquor picis alkalinus, use of, in infantile eczema, 313.

Lithæmia as a disturbing factor in inflammation of auditory canal, 342, 344.

Lithotripsy, 158.

Liver, a case of enlarged, with jaundice, 76.
 history of case, 76.
 subsequent symptoms of case, 79.
 cancer of, 77, 78.
 differential diagnosis of, 77.
 enlargement of, 80.
 fatty, 80.
 hydatid, 81.
 hypertrophic cirrhosis of, 82.
 waxy, 81.

Loomis, Alfred L., M.D., 53.

Lupus vulgaris, 326.

Lymphangitis as a cause of puerperal fever, 170.

M.

MacDonnell, Richard Lea, B.A., M.D., 76.

Mackenzie's dilator for stricture of larynx, 294.

Manipulation, combined, in detection of early pregnancy, 161.

Mann, Matthew D., A.M., M.D., 160.

Massage in treatment of alcoholic paralysis, 276.
 of ovaralgia, spinal irritation, and anæmia, 180.
 of sciatic neuritis, 282.
 of syphilitic tubercle, 327.
 of traumatism, 228.

Medicine, 1, 19, 30, 35, 43, 53, 62, 65, 76, 84.

Meningitis as a cause of cerebral paralysis, 204.
 coma of, characteristic symptoms, 89.

Menthol, use of, in lichen planus, 321.

Mercury, use of, in acromegaly, 18.
 yellow oxide of, in inflammation of auditory canal, 349.
 protoiodide of, in syphilitic ulcer of vulva, 178.

Milk, ice-cold, use of, in tonsillar diphtheria, 203.

Mills, Charles K., M.D., 247.

Mitchell, S. Weir, M.D., LL.D., 277.

Morphine, use of, in chorea, 222.

Myelitis, differential diagnosis, 233.
 electricity most efficient treatment in, 208.
 intelligence not impaired by, 208.

Myopia, 333.

Myotonia and athetoid spasm, 247.
 I. Myotonia and inertia on voluntary effort, 248.
 differential diagnosis, 248, 253.
 history of case, 248.
 treatment, 254.
 II. Athetoid spasm and myotonia of voluntary effort: history of case, 257.
 congenita, 252.

Myrrh wash, in treatment of ulcers, 112.

Myxœdema, 17.

N.

Nails, method of cleansing, in antiseptic surgery, 102.

Nancrede, C. B., M.D., 144.

Naphthol, use of, in lichen planus, 321.
 in psoriasis, 305.

Nerve-stretching in sciatic neuritis, 282.

Neuralgias, treatment of, 277.

Neurasthenia, (kinds of,) 233.
 (1) sexual: characteristic symptoms, 237, 240.
 history of case, 237.
 treatment, 240.
 (2) alcoholic, or tobacco: characteristic symptoms, 242.
 history of case, 242.
 treatment, 242.
 (3) of fatigue: differential diagnosis, 238, 239.
 history of case, 243.
 symptoms, 243.
 treatment, 246.

Neurology, 225, 237, 247, 265, 277.

Neuro-myotonia, 252.

Nitrate of silver solution, use of, in inflammation of auditory canal, 34, 341.
 syphilitic ulcer of vulva, 177.

Nux vomica in treatment of ovaralgia, spinal irritation, and anæmia, 180.

O.

"Obstetric hand," 190.

Odor, cancerous, lessened by corrosive-sublimated solution, 189.

Oedema, accompaniment of localized periostitis, 117.
 acute, of pharynx, 37.
 symptoms, 37.
 treatment, 37.
 of ankles, 110.

Ohmann-Dumesnil, A. H., M.D., 306.

Ointment, an efficacious, in infantile eczema, 311, 313.

Opium, efficiency of, in healing indolent ulcers, 109.
 internal administration of, in treatment of ulcers, 112.
 poisoning, coma of, 89.
 characteristic symptoms, 89.

Ophthalmology, 328.

Ophthalmometer, 335.

Ophthalmoscope, 334.

Optic nerve, color of, difficulty of distinguishing, 233.

Osteitis deformans, 17.

Otology, 340.

Ovaralgia, 178.

Ovariectomy, consequences of, 179.
 failure of, to relieve ovaralgia, 179.
 in hysteria, 180.

Oxide of zinc, use of, in infantile eczema, 308, 311.

P.

Papayotin, use of, in tonsillar diphtheria, 203.

Papillomata in larynx, 290.

- Paquelin's cautery button, use of, in sciatica neuritis, 280.
- Paralysis, different types of in young children, 204.
- I. Cerebral types of infantile paralysis, 205.
 - history and physical examination of cases, 205.
 - II. Localized paralysis, description of cases, 205, 210.
 - differential diagnosis of the two groups, importance of, 206, 209.
 - treatment, possibility of successful, 207.
 - value of electricity in diagnosis of, 211.
- Paraplegia, spastic (spasmodic), 204.
- Parke, Charles, T. M.D., 123.
- Parovarian cyst, description of, 193.
- differentiated from ovarian cyst, 193.
- Parvin, Theophilus, M.D., 176.
- Pediatrics, 195, 204, 213.
- Periostitis, 118.
- Peripheral neuritis, intelligence not impaired by, 208.
 - treatment, 208.
- Peritonitis as a cause of puerperal fever, 170.
- Personal equation in treatment of traumatic hysteria, 236.
- Pessaries not a cause of uterine tumor, 190.
- Petroleum preparations, use of, in infantile eczema, 310.
- Phosphide of zinc, use of, in neurasthenia, 242.
- Phosphorus, efficacy of, in neurasthenia, 241.
 - Thompson's solution, 241.
 - use of, in alcoholic paralysis, 242.
- Phthisis, 70, 74.
 - pleuritic adhesions in, preventing rupture of pleura, 74.
 - as a cause of puerperal fever, 170.
- Placenta, retained after miscarriage, 190.
 - history of case, 190.
 - operation, 191.
- Pleurisy as a cause of puerperal fever, 170.
- Pneumonia as a cause of puerperal fever, 170.
- Pneumonia; cirrhotic kidney and liver; fibroid degeneration of the heart, 53.
 - I. Pneumonia: diagnosis, 53.
 - history of case, 53.
 - symptoms, 53.
 - treatment, 54.
 - II. Cirrhotic kidney and liver: diagnosis, 58.
 - history of case, 56.
 - symptoms, 57.
 - treatment, 59.
 - III. Fibroid degeneration of the heart: diagnosis, 60.
 - history of case, 59.
 - treatment, 61.
- Pneumothorax followed by hydrothorax, 66.
- Polymyelitis, 208.
- Poltzer's inflations, 345.
- Polysæmia or plethora in its relation to inflammation, and the treatment of pathological processes in general, 19.
 - consequences, 21-29.
 - etiology, 20.
 - symptoms, 20.
- Porencephalitis as a cause of cerebral paralysis, 204.
- Porter, William Henry, M.D., 19.
- Pregnancy, diagnosis of, by combined manipulation, 161.
 - displacement of uterus accounted for in, 162.
 - early diagnosis of, 160.
 - extra-uterine pregnancy distinguished in, 162.
 - history of case, second month, 160.
 - symptoms, 160.
- Psoriasis, 298.
 - diagnosis of, 301.
 - differential diagnosis, 301, 326.
 - forms of:
 - psoriasis annulata or gyrata, 300.
 - diffusa, 300.
 - guttata, 300.
 - inveterata, 301.
 - nummulata, 300.
 - punctata, 300.
 - rupioides, 300.
 - universalis, 300.
 - history of cases of, 298, 299.
 - microscopic examination of skin, 301.
 - prognosis, 305.
 - remarks on appearance of, 298.
 - treatment, 303.
 - local, 304.
- Puerperal fever, 164.
- Pyelonephrosis, abdominal nephrectomy for, 144.
 - Langenback's incision, 145.
 - operation, 145.
- shown by presence of pus in the urine, 144.
- Pyrogallie acid, use of, in lichen planus, 321.

Q.

Quinine, use of, when, in chorea, 223.

R.

"Railway spine," 226.

Reflex irritation as a cause of puerperal fever, 172.

Rheumatism a common cause of perlostitis, 118.

Rhubarb, use of, in neurasthenia, 242.

Ringworm, 326.

Ross, James, M.D., LL.D., 1.

Robson, W. Mayo, F.R.C.S., 148.

S.

Sachs, B., M.D., 237.

Salicin, use of, in alcoholic paralysis, 276.

Salicylate of sodium, use of, in alcoholic paralysis, 276.

Salicylate salts, use of, in chorea with rheumatic symptoms, 223.

Salicylated lanolin ointment, use of, in congenital alopecia, 322.

Salicylic acid, use of, in lichen planus, 321.

- in psoriasis, 304.

Salves, benzoated oxide-of-zinc, 110.

- cold creams, objections to, 110.
- glycerin, 112.
- in treatment of ulcers, 110.
- prepared with salicylates, carbolic acid, or benzoin, prevent degeneration of, 110.

- Sarcoma, cystic, of the thigh, 132.**
 Wyeth's hip-joint amputation in a case of, 132.
 history of case, 134.
- Scarlet fever, 196.**
 differential diagnosis, 196.
- Sciatic pain, obstinate, treatment of, by splint-rest and cold, 277.**
 differential diagnosis, 279.
 history of case, 277.
 sciatic neuritis, 279.
 treatment, 283.
- Scirrhus of the breast; epiphyseal fracture of the upper end of the humerus, 123.**
 Scirrhus of the breast, 123.
 diagnosis, 127.
 operation for removal, 124.
 dressing after, 126.
- Sclerosis, disseminated, 1.**
 Shattuck, Frederick C., M.D.
- Sensibility, perversion of, in a case of ovaralgia, 178.**
- Silk, method of carrying, 104.**
 sterilized by heat, 104.
- Soap, green, in congenital alopecia, 322.**
 use of, in infantile eczema, 310.
- Soda-and-opium wash, composition of, 107.**
 in treatment of painful ulcers, 107.
- Solis-Cohen, J., M.D., 285.**
- Sore throat, 35.**
 adenoid disease, or chronic tonsillitis in children, 40.
 symptoms, 40.
 treatment, 40.
- catarrhal pharyngitis, 35.**
 treatment, 35.
- hospital, 39.**
 causes, 39.
 treatment, 39.
- cedema, acute, of pharynx, 37.**
 symptoms, 37.
 treatment, 37.
- syphilitic, 39.**
 symptoms, 39.
 treatment, 39.
- tonsillitis, or quinsy, 35.**
 symptoms, 35.
 treatment, 36.
- Spasmodic (spastic) paraplegia, 204.**
- Spinal irritation, 178.**
- Starch poultice, use of, in infantile eczema, 310.**
- Sterilization in antiseptic surgery, 102.**
 absolute alcohol, 103.
 Arnold sterilizer, 104.
 bichloride gauze, 104.
 bichloride solution, compressed tablets, to make, 103.
 by boiling, 102.
 by heat, 104.
 carbolic solution, 102.
 carbonate of soda, 102.
 of clothing, 103.
 of instruments, 102.
 of nails and hands, 102.
 of silk by heat, 104.
 Sattegast sterilizer, 104.
 Schimmelbusch sterilizer, 102.
 sublimate solution, 103, 104.
- Strychnine, efficacy of, in sexual neurasthenia, 241, 246.**
- Strychnine, hypodermic injections of, in traumatism, 228.**
 use of, in chorea, 223.
- Stricture of the larynx, 285.**
- Sunstroke, coma of, how distinguished from comatose condition of patient in uræmic convulsions, 88, 89.**
- Suppuration, after ten days, sign of mistake, 106.**
 treatment of, in antiseptic surgery, 106.
- Surgery, 102, 107, 113, 123, 132, 138, 144, 148.**
- Surgical operations, modern methods in, 102.**
 drainage by fenestrated rubber tube, 106.
 by horse-hairs, bundle of, 106.
 dressing, method of, 106.
 flushing, 104, 106.
 Landerer's dry method, 104.
 nails and hands, cleansing of, 102.
 possible results, 106.
 silk, method of carrying, 105.
 sterilization of clothing, 103.
 of instruments, 102.
- Syphilis a common cause of periostitis, 118.**
 as a cause of amenorrhœa, 177.
- Syphilitic sore throat, 39.**
 symptoms, 39.
 treatment, 39.
- Syphilitic ulcer of the vulva, ovaralgia, spinal irritation, and anæmia, 176.**
 I. Syphilitic ulcer of vulva: history of case, 176.
 symptoms, 176.
 treatment of, 177.
 (1) local, 177.
 (2) constitutional, 178.
- II. Ovaralgia, spinal irritation, anæmia, 178.
 history of case, 178.
 symptoms, 178.
 treatment, 180.

T.

Tannin ointment, use of, in infantile eczema, 308.

Tar, use of, in lichen planus, 321.

Temperature, elevation of, during the puerperal period, 164, 166.
 causes of, 167.

- (1) infectious:
 acute septicæmia, 170.
 auto-infection, 169.
 bronchitis, 171.
 cellulitis, 170.
 cystitis, 170.
 diphtheria, 171.
 endometritis, 170.
 erysipelas, 171.
 lymphangitis, 170.
 malaria, 171.
 peritonitis, 170.
 phthisis, 171.
 pleurisy, 171.
 pneumonia, 171.
 rheumatism, 171.
 scarlatina, 171.
 vaginitis, 170.
 vulvitis, 170.
 wound-infection, 167.

Temperature, elevation of, during the puerperal period, causes of:
 (2) non-infectious:
 emotional disturbances, 171.
 exposure to cold, 172.
 reflex irritation, 172.
 precautions to prevent, 173.
 Thomsen's disease, 252.
 differential diagnosis, 253.
 treatment, 254.
 Thymol, use of, in psoriasis, 305.
 Tonsillar diphtheria, 195.
 diagnosis, 196.
 differential diagnosis, 197.
 history of case, 195.
 prophylaxis, 200, 203.
 treatment, 200.
 Tonsillitis, or quinsy, 35.
 chronic or adenoid disease, 40.
 symptoms, 35.
 treatment, 36.
 Tracheotomy in acute cedema of the pharynx, 38.
 Tracheotomy-tubes, 38, 286, 296.
 fenestrated, objections to, 287, 292.
 silver, superiority of, over rubber, 288.
 use of, in stricture of larynx, 286.
 Traumatic neurasthenia, 226.
 treatment, 227, 231.
 spinal jacket in, 231.
 Traumatisms, remote effects of, as seen by the neurologist, 225.
 I. Traumatic sore back, causes of, 226, 228.
 examination of, best method, 229.
 paralysis of muscle (deltoid) by blow, 227.
 of nerve by blow, 227.
 treatment, 227, 231.
 II. Traumatic hysteria, 232.
 diagnosis of, reasons for, 234.
 history of case, 232.
 progress more favorable than in other forms, 235.
 symptoms, 233.
 treatment, 236.
 personal equation in, 236.
 Trypsin, use of, in tonsillar diphtheria, 203.
 Turpentine as a disinfectant for hands after examination of cancerous vagina, 190.

U.

Ulcers, 107.
 history of cases, 107-111.
 treatment of, 107-111.
 Uræmic, kreatin, kreatinin, and urea, probable toxic agents in, 91.
 treatment, 93.
 Uræmic coma, differential diagnosis, 89.
 Uræmic convulsions; epilepsy; dysphagia, due perhaps to pressure of a stray thyroid gland, 84.
 I. Uræmic convulsions, history of case, 84.
 differential diagnosis, 88.
 prognosis, 92.
 symptoms, 86, 87.
 toxic principle in, 91.
 treatment, 92.

Uræmic convulsions; epilepsy; dysphagia, due perhaps to pressure of a stray thyroid gland:
 II. Epilepsy, history of case, 95.
 III. Dysphagia, history of case, 96.
 prognosis, 97.
 symptoms, 97.
 treatment, 101.

Urea, 92.

Ureters, sounding of, 185.

Urethritis; dilatation of the Urethra; sounding of the ureters; anterior elytrorrhaphy; a new method of performing lateral elytrorrhaphy, 182.

I. Urethritis; sounding of ureters; anterior elytrorrhaphy; history of case, 182.
 treatment, 180.

Uterine tumor, pessaries not a cause of, 190.

Uterus, displacement of, accounted for in diagnosis of early pregnancy, 162.

V.

Varicose veins in leg, elastic stockings for, 111.

rubber bandages, objections to, in treatment of, 111.

Vaseline, oil of, use of in inflammation of auditory canal, 341.

Vulva, syphilitic ulcer of, 176.

Vulvitis as a cause of puerperal fever, 169.

W.

Wood, H. C., M.D., 225.

Wyeth's hip-joint amputation in a case of cystic sarcoma of the thigh, 132, 135.

X.

Xanthoma; lichen planus; congenital alopecia; syphilitic tubercle, 316.

I. Xanthoma, history of case, 316.
 microscopic examination, results of, 317.

treatment, 318.

II. Lichen planus, description of, 319.

differential diagnosis, 319.

history of case, 318.

treatment, 321.

III. Congenital alopecia, history of case, 321.

treatment, 322.

IV. Syphilitic tubercle, differential diagnosis, 325.

history of case, 322.

treatment, 326.

Z.

Zinc sulphate, use of, in chorea, 222.

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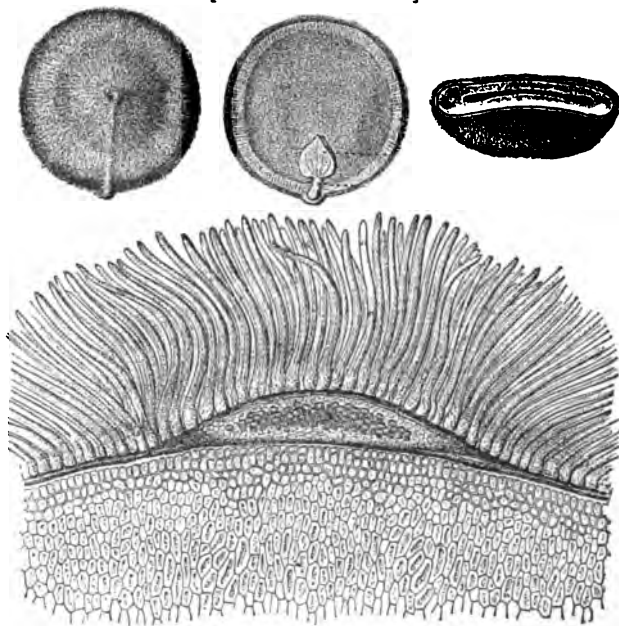
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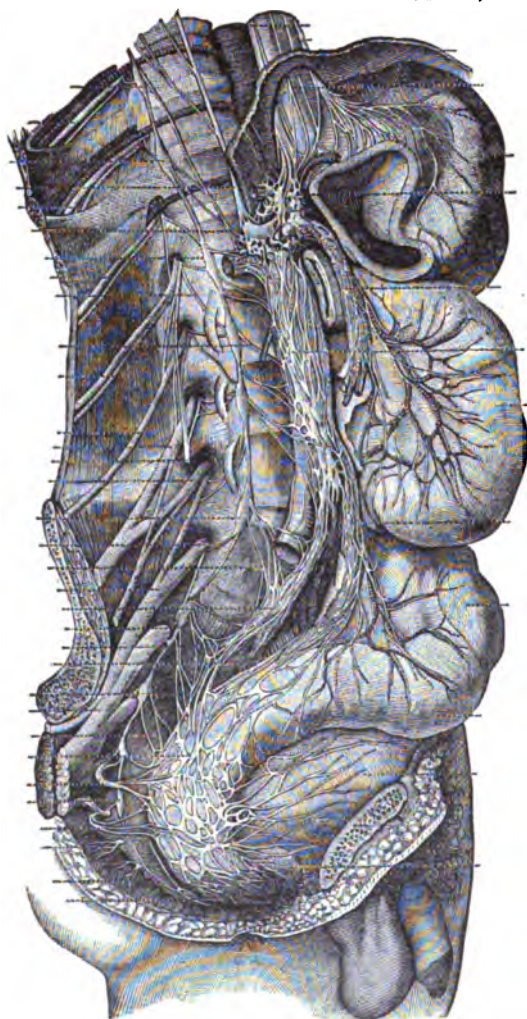
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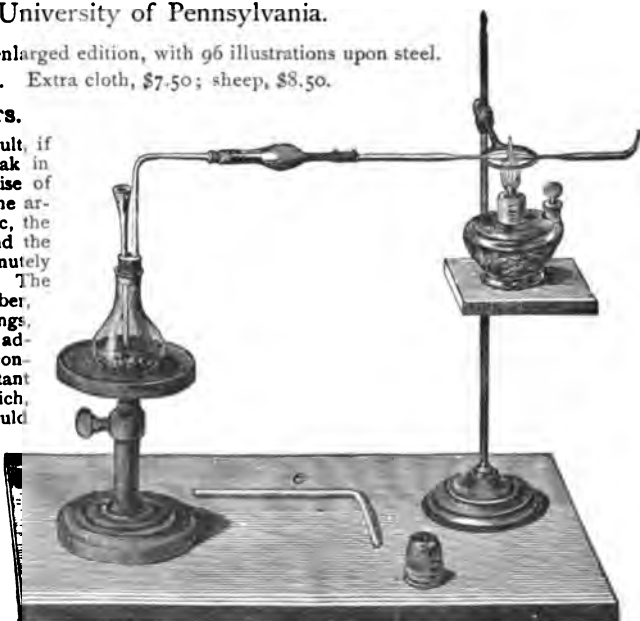
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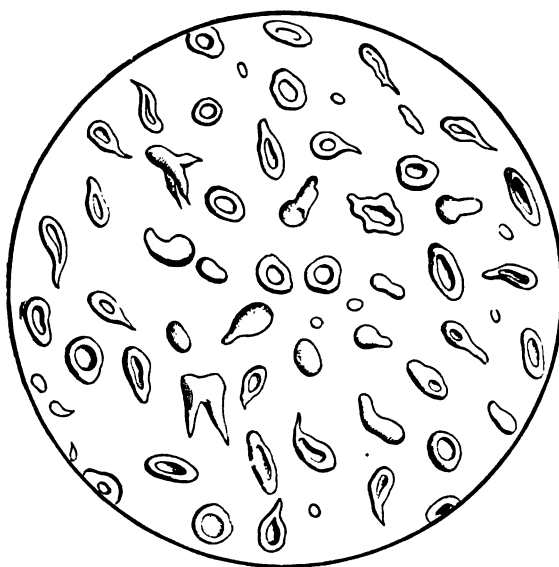
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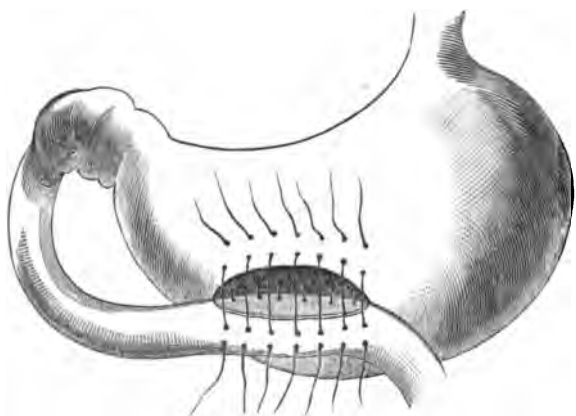
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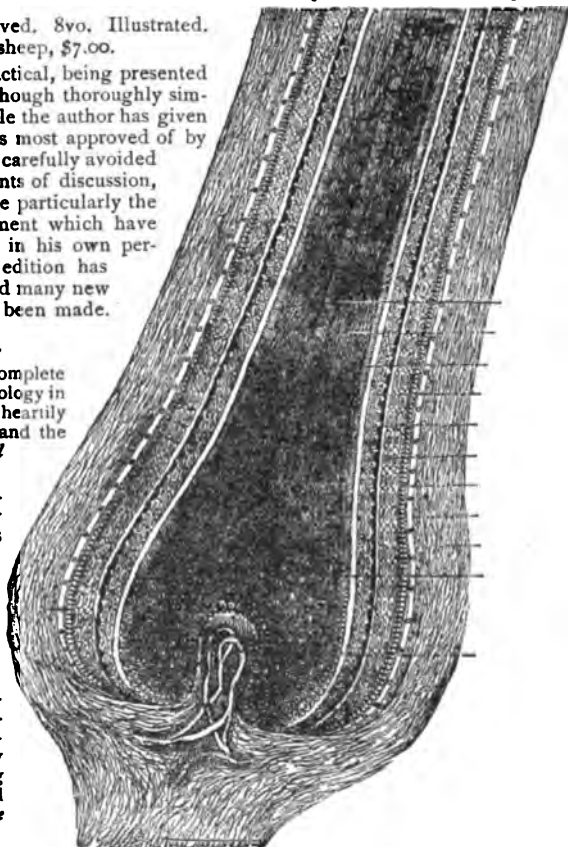


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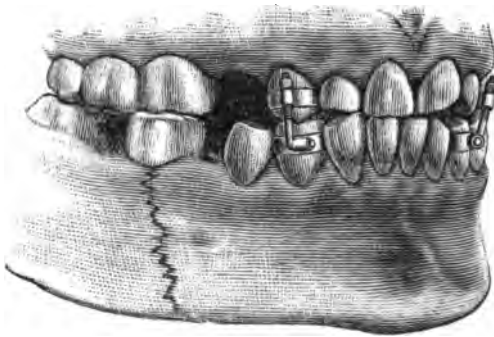
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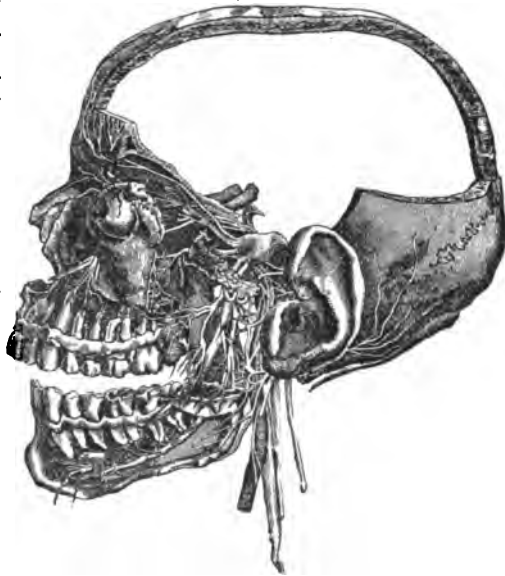
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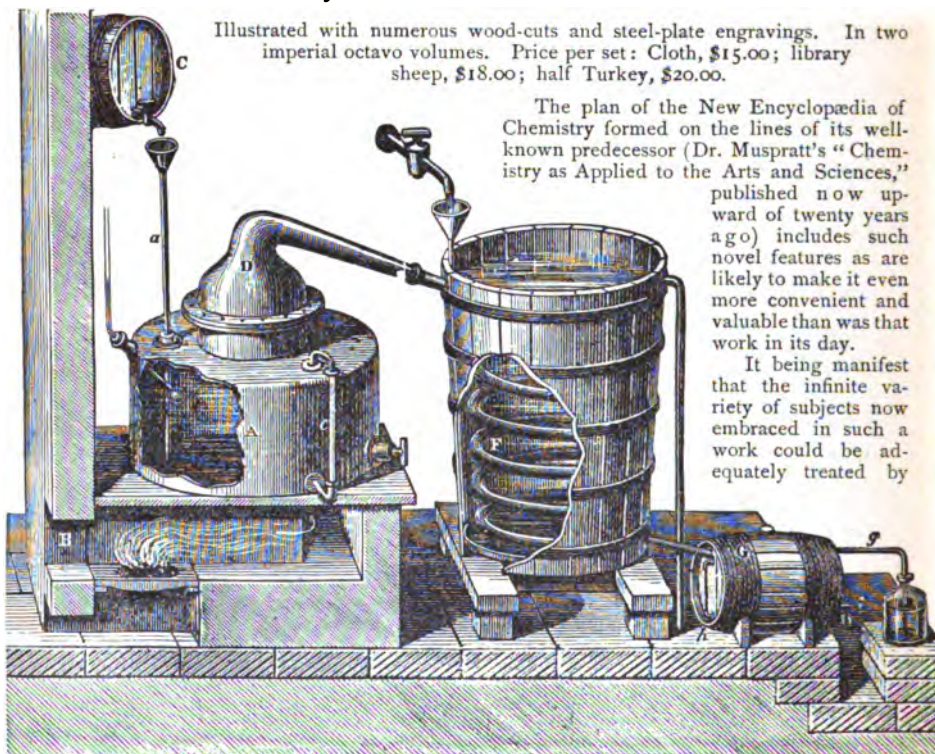
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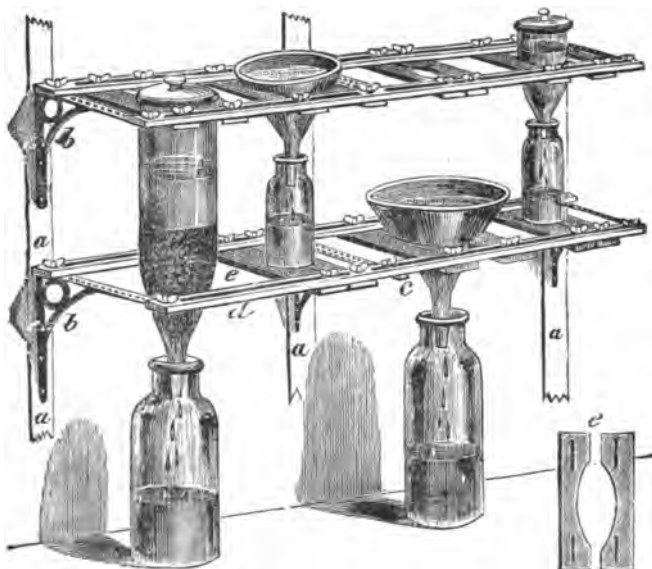
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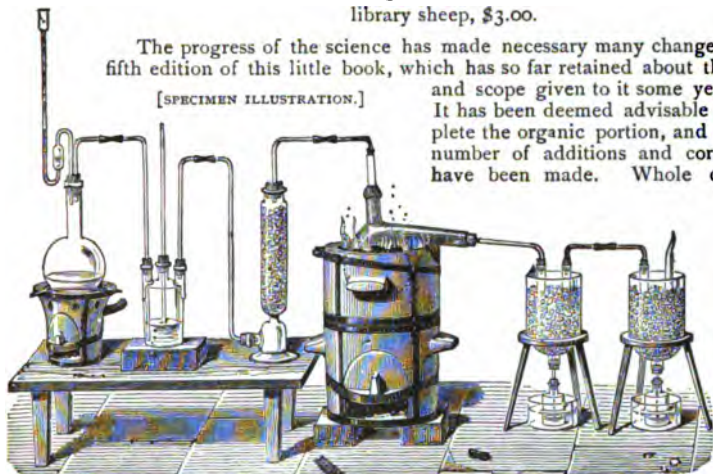
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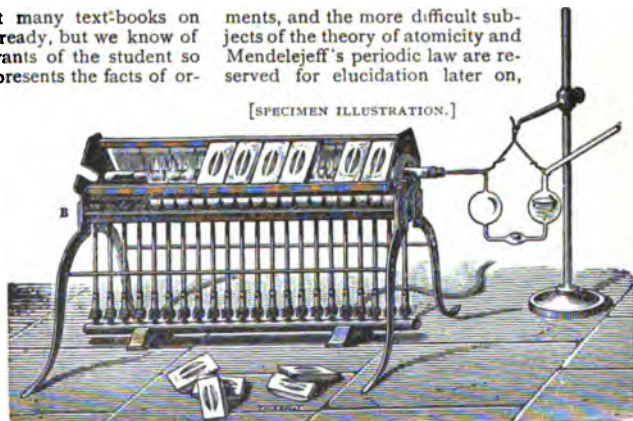
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